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SYMPOSIUM: BRONCHOSCOPY AND ESOPHAGOSCOPY. THEIR INDICATIONS AND CONTRA-INDICATIONS.

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SECOND PAPER:—DOCENT OTTO KAHLER, Vienna.

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THE HISTORY OF BRONCHOSCOPY AND ESOPHAGOSCOPY.*

BY PROF. GUSTAV KILLIAN, BERLIN.

Translated by Dr. M. A. Goldstein, St. Louis.

It is a matter of pleasure and satisfaction to contemplate the remarkable development of the direct methods of examination of the upper-air tract. Not only may this be regarded as an important progress in laryngology, but the entire field of medical science has been influenced by this research.

By its aid our specialty has been thoroughly rejuvenated and has received an impetus to develop along broader lines.

The progress of laryngology has not only found recognition in medical circles by its means, but the laity has also awakened to its advancement.

We are only in the beginning of its development. A vast amount of material has accumulated which must be tested, observed and arranged. Day by day this scientific data increases so that it will soon be difficult to keep pace with it. It was quite an undertaking to conscientiously gather the complete literature; the time was too

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limited to attempt a detailed analysis. I present to-day, therefore, a general review. A more detailed consideration of this field will be developed by my confrères.

From the time that Kussmaul (1868), and v. Mikulicz (1881), first took up the question of esophagoscopy and gastroscopy until the end of the year 1910, 410 publications on esophagoscopy and 34 on gastroscopy have appeared. Direct laryngo-trachea-bronchoscopy, first developed by Kirstein, in 1895, and Killian, in 1896, has already produced 672 publications; an aggregate, therefore of 1,116 articles have appeared.

I desire to present a brief review of the subject as participated in by the various countries:

Of the 410 publications on esophagoscopy, 351 have appeared in Europe, 58 in America and 1 in Japan. The European countries have participated in varying proportion to their size, the numerical strength of their laryngologists and the interest which they have developed in this new field. Germany leads with 116 publications, France 76, Austria 51, and Spain with 46. In contrast to this, some countries show a less active participation: England 13, Russia 10, Italy 9, Belgium 7, Hungary 6, Denmark 5, Sweden and Norway 5, Holland 4, and Switzerland 3.

Of the 34 publications on gastroscopy, Germany leads with 18, Britain 5, United States 5, Austria 3, France 2, and Hungary 1.

Direct laryngo-tracheo-bronchoscopy has also found in Germany its leading advocate, 198 publications. American colleagues have here been very active as their 119 publications indicate; then France 96, Austria 83, and Spain 42. The other countries soon realized the significance of this new method: England 24, Russia 22, Belgium 15, Hungary 14, Sweden and Norway 12, Italy 12, Denmark 10, Holland 8, Switzerland 5, Chile and Argentine 9, Japan 3.

We may acquire a better idea of the way in which the development in this field has been accomplished if we analyze the work annually of the several authors in various countries.

Esophagoscopy began in the year 1868, with one publication, 2 in 1881, 2 in 1882, 1 in 1887, 3 in 1889, 1 in 1893, and 2 in 1894. From 1895 the development became more active, yet not until 1901 did marked activity begin. There were 6 publications in 1895, 9 in 1896, 9 in 1897, 10 in 1898, 8 in 1899, 7 in 1900 and 11 in 1901.

In 1902 an appreciable and distinct increase in interest and scientific data was developed, due, no doubt, to the advent of bronchoscopy.

Bronchoscopy was so unusually effective in the extraction of foreign bodies that old and young workers were stimulated to efforts not restricted alone to the upper-air passages, but to the digestive tract where there was more occasion for its application.

In 1902 there were 17 publications on esophagoscopy, 11 in 1903, 15 in 1904, 26 in 1905, 21 in 1906, 33 in 1907, 60 in 1908, 81 in 1909 and 75 in 1910.

This unusual development of esophagoscopy is due to the laryngologists. While this work was still in the hands of isolated surgeons and internists and the laryngologists remained disinterested, it was of little importance. Not until the laryngologists earnestly participated in this work did it become of general value, general interest and unusual importance. Step by step this method of examination was applied to the entire field of diseases of the esophagus and, like the laryngoscope, disclosed many affections in the living which had previously only been recognized in post-mortem.

I am not prepared to predict the outcome of gastroscopy. This difficult technic is but in its infancy and must develop a more practical form of application before it can be of general service.

It is interesting to note the fact that direct examination of the air-passages made active strides only after 1902.

In 1902, 18 articles appeared, 21 in 1903, 32 in 1904. This was but a forerunner to the following number of increased publications: 81 articles on laryngo-tracheo-bronchoscopy were published in 1905, 58 in 1906, 75 in 1907, 99 in 1908, 119 in 1909, 18 in 1910. The development of direct examination of the air-passages has been more active than that of esophagoscopy and has materially influenced the latter.

The unusually rapid progress is explained by the fact that in certain years other countries participated actively in this work and we may now say that this method has been disseminated throughout the world and has become one of the valuable medical accessories; it has disclosed the larynx to the eye and to the hand in an entirely new aspect and has actually revealed the trachea and bronchi for the first time. To remove a foreign body in a direct way from a bronchus of the second and third caliber, seemed impossible; to the practiced hand it is now not a difficult task.

We obtain a broader insight into the entire literary movement called forth by the direct method when we consider separately the publications according to time, countries and authors. Even if we

ascribe to Kussmaul the first direct esophago-gastroscopy in Germany, we are obliged to attribute its practical solution to Austria.

In Vienna, v. Mikulicz solved the problem in 1881. Stoerk (1887), devoted especial attention to it and v. Hacker (1889), carried it to such completion that it became of use in practice. Except in Germany, this work aroused but slight notice. (See Barattoux, 1882).

Von Hacker championed the new and splendid work and his ever-improving results removed every doubt. For years he stood alone for the cause in Vienna, supported only by Stoerk and his school (Ebstein). Comparatively late others followed his example, such as Harmer and Lotheisen. Until 1908, however, even with the cooperation of H. von Schroetter, esophagoscopic literature was but meager. From 1908, work in this field became more active in Austria. (Six publications in 1908, 5 in 1909, 6 in 1910).

The first articles of v. Hacker (1889), created a deep impression in Germany. This became more pronounced (excepting the publication of Loewe, in 1893), with the active work in esophagoscopy by Rosenheim, in Berlin. His numerous writings appear until the recent period. Ewald, Kelling, Gottstein, Kirstein, and since 1899, G. Killian, follow. The number of esophagoscopic writings from 1895 to 1903 averaged between five and ten annually.

The first kindred in America was that of Max Einhorn, in 1897. This was followed by Gordon King, in 1899, Fletcher Ingals, in 1903, Coolidge in 1905, and especially by Chevalier Jackson, whose work not only in esophagoscopy, but also in gastroscopy, has been of such great prominence. Mention should also be made of Yankauer, Mosher, Stillmann, Large, E. Mayer and others. In 1908, publications in this field in America were doubled, fourteen, and it has maintained this ratio. In 1909, del Rio, in Chili, was the first to introduce esophagoscopy in South America.

France developed unusual activities in the direct examination of the esophagus and in the number of publications is second only to Germany.

With the exception of the work of Vallas and Duperon (1902), activities began here comparatively late, (1905). A real interest was not awakened in France, however, until attention turned to bronchoscopy and after Moure, Texier and Jacques visited me in Freiburg, as is mentioned in Brindel's Historical Treatise. Besides Garel, Brindel (1905), Béze, Valentin, Guisez above all, since 1905, has devoted himself to esophagoscopy. In France, 9 publications

appeared in 1907, 12 in 1908, 23 in 1909, 23 in 1910, which was a far greater number than appeared in any other country.

Our Spanish confrères were no less active.

Botey (1902), Tapia (1903), and Botella (1904), were warm advocates of esophagoscopy and their work competed with that of Germany. In 1906, 6 publications appeared, 8 in 1908, 11 in 1910. Among the other nations, Belgium began in 1905 (Delsaux), Switzerland in 1905 (Siebenmann), Denmark in 1906 (Schmiegelow), England (Paterson), Russia (Wegłowski), 1907 Japan (Kubo), 1908 Holland (Burger), Norway and Sweden (Waller, Tetens-Hald and in the following year Holmgren and Kayser), Italy (Adjello, Cigna), 1909 Massei, Tanturri, Canalejo, Lozano. In the field of gastroscopy besides the older workers, I mention Rosenheim, Sauther, Kelling, Perl, Chevalier Jackson, Morrison, Thompson, Delande, Elsner, etc.

Let us take a similar view of direct laryngoscopy and tracheobronchoscopy. A separation of the two was impossible. The development of this method began in 1875, in Germany, with Voltolini and in 1888 in Austria with Pieniazek.

In 1895, Kirstein astonished the laryngological world with his direct upper laryngoscopy and was so successful that he immediately published seven articles; in the following year, 5, and in 1897 he treated the subject in four articles. In 1896, he found followers in V. Bruns and G. Killian, and in 1897, in Max Thorner (Cincinnati).

Direct laryngoscopy was productive of unusual results. In 1897, G. Killian employed it in direct tracheoscopy and its clinical application and one year later applied it in direct upper and lower bronchoscopy. This he presented in Heidelberg to the Society of South German Laryngologists, on May 29. It proved to be a marking-stone not only in this epoch-making period of the direct method, but also in the entire realm of laryngology, as clearly indicated by the unusual literary activity. Direct bronchoscopy created more enthusiasm even than direct laryngoscopy, and stirred up interest everywhere.

In Germany, Killian and his school (Wild, Henrici, v. Eicken, Just and Brünings) by their numerous publications, made a deep impression. Among co-operators may be mentioned J. Killian (Worms), Neumeyer, Helferich, Kümmel, Speiss, Noltenius, Nehrkorn, Denker, Gottstein, Kausch, Kob, Thost, Mann, E. Meyer and others. In 1905, there were 31 publications in Germany on Bronchoscopy, 12 in 1906, 18 in 1907, 14 in 1908, 23 in 1909, 33 in 1910.

The Vienna school (H. v. Schroetter Chiari, Kahler), took up bronschoscopy with great enthusiasm. In Austria, Pieniazek and Nowotny were also active participants. Since 1905, nine to thirteen published articles appeared annually.

In America, Coolidge began this work as early as 1899. Only after 1904, however, did activities begin with the efforts of Fletcher Ingals, Schmyzer, Chevalier Jackson, Mosher, E. Mayer, Yankauer, Clayton, Elsberg, and others. In 1908 there were 28 papers on direct examination of the air-passages published in America alone; 22 in 1909, 19 in 1910.

France, too, deserves special mention. Among the early workers in this field we find: Jaques, Garel and Cavaillon in 1901; Moure in 1902, Texier, Lermoyer and Guiser in 1903. Guiser has been unusually active in this field and has accomplished much. In 1905 there were thirteen publications on direct laryngo-tracheo-bronchoscopy in France; nineteen in 1908; sixteen in 1910.

Of the European countries participating in this work, we mention chronologically: Switzerland—Wild, Kränlein in 1902; Spain—Tapia in 1903;—Belgium, Tretrop in 1903; England—Patterson in 1904; Italy—Massei in 1904; Norway and Sweden—Lind in 1904; Japan—Okada and Yoshu; Holland—Kan in 1905; Hungary—Paunz, Winternitz, Finaly, György in 1905; Denmark—Schmiegelow in 1906; Russia—Schmidt in 1906; South America—Zamprini, Del Rio, Middleton, Quadi, Segura in 1908.

Mention should also be made of Siebenmann and Nager in Switzerland; of that active trio in Spain, Tapia, Botey and Botella, who have accomplished much in bronchoscopy, and also Compaired, Goyanes and others. In Spain, since 1907, there are eight to ten articles published annually. In Belgium, Goldschmidt, Delsaux, de Stella and Van der Wildenberg should be mentioned; in England, Brown Kelly, Tilley, Waggett, Mofat (Capetown); in Canada, Wishart; in Italy, Stazza, Tanturri, Melzi; in Norway and Sweden, Waller, Holmgren, Uchermann and Kayser; in Holland, Burger; in Hungary; Polyak; in Denmark, Mahler, Schioedte; in Russia, Mintz, Schneider, Zitowitsch, Iwanow, Rontaler.

It is certainly worthy the effort to have presented the history and evolution of this field, and enumerated every worker in chronological sequence before the activities and literature accumulated so fast as to make the task impracticable.

The time is approaching when the direct method of examination of the upper air tract will be quite a matter of routine in our work

and not an extraordinary and exceptional proceeding in selected cases. It will soon be more difficult to trace its special influence on laryngology in detail.

The history of esophagoscopy and bronchoscopy afford an excellent example of the influence on science of the introduction of a new procedure, and how rapidly in this fast-whirling age a useful innovation can make its influence felt in medical science.

The introduction of the direct method of examination of the upper air-passages is an incalculable blessing to mankind.

Removal of an Open Safety-pin from the Trachea by Upper Bronchoscopy. G. HUDSON-MAKUEN. *Jour. A. M. A.*, July 22, 1911.

Makuen reports a case of removal of an open safety-pin which had been swallowed during laughing by a girl of 13, by upper bronchoscopy. The skiagraph showed the pin in the trachea. The Jackson bronchoscope was passed into the trachea in the usual manner through the laryngoscope. The flat square head of the pin came almost immediately into view and by means of the special instruments devised originally, he thinks, by Dr. Algernon Collidge, Jr., of Boston, the distant spiral end of the pin was engaged in the ring and the pin was closed with a forked probe. When attempting to withdraw the bronchoscope and instruments with the pin attached, it was found impossible and Hudson-Makuen decided to withdraw the two instruments in the tube, first, the pin pusher and then the ring instrument, and the pin came out on the end of the ring, which snapped off on the floor before they could see how it was engaged. It was then with considerable difficulty that the glottic spasm was overcome and the tube removed from the larynx. The patient bore the anesthetic and the operation well without loss of blood or serious after effect.

BRONCHOSCOPY AND ESOPHAGOSCOPY: THEIR INDICATIONS AND CONTRA-INDICATION.*

BY DOCENT OTTO KAHLER, VIENNA.

(Translated by Dr. M. A. Goldstein, St. Louis.)

To me has been assigned the task of presenting the special achievements of direct laryngo-tracheo-bronchoscopy. The impetus which has been developed in the 14 years' existence of the Killian method is remarkable; there is perhaps scarcely a laryngologist who is unfamiliar with this readily acquired technic, and who cannot relate successful and possibly life-saving results. In the past few years the many improvements in instrumentarium suggested by numerous authors seem to indicate that non-specialists, internists and surgeons are satisfactorily using this method, especially as it is a technic, as Brünings observed at the Vienna Congress, easier to acquire than the indirect method.

It is difficult to separate direct laryngoscopy from bronchoscopy in an estimation of the results of the former; the method inaugurated by Kirstein was the pathfinder to Killian in the accomplishment of his brilliant results. It is noteworthy that direct laryngoscopy, notwithstanding the improvements in the instrumentarium of Kirstein by Killian and Brünings, has not yet received the full recognition to which it is entitled. Kirstein wrote in 1895: "The new method now enters in competition with the old, and its purpose will be not to supplant the old but to supplement it."

We have now reached this goal. Direct laryngoscopy has become indispensable. What advantages over the old method does it offer? Autoscopy is of greatest value in the examination of infants and small children. I would not say that examination of infants with the laryngeal mirror is impossible; the direct method, however, is easier and less unpleasant for the child because it can be more promptly performed. With small children the examination may be made without general or local anesthesia provided the child is properly held. Wild indicated that autoscopy could be more easily performed on children than adults; the spinal column is more flexible, the tongue is less muscular and easily compressible, the passage of the pars laryngea of the pharynx into the axis of the trachea more direct than in the adult. We shall not discuss the technic here. The various methods do not differ greatly. It is

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more or less immaterial whether the patient is examined in sitting or lying position, as suggested by Kirstein and the Killian school, in the left lateral position of Mosher or with the head bent forward as advocated by Johnston.

In the new-born with congenital stridor, autoscapy has explained many cases. It is well known that various theories have been advanced to explain stridor congenitus. Direct laryngoscopy seems to be called upon to help explain this question. Halsted found the cause of the stenosis in a two-hour-old infant to be a thyroid and thymus hypertrophy producing tracheal compression. This substantiates Speiss' findings in three cases of stridor congenitus caused by thymus hypertrophy. Patterson found on examination during an attack that in inspiration the soft tissues about the cricoid cartilage, including the arytenoid and inter-arytenoid folds are drawn downward and forward into the larynx, and especially in serious cases to such an extent that the upper border of the cricoid could be seen through the stretched mucous membrane as a transverse fold.

Kelly also found thymus hypertrophy in a child, and in several others anomalies of the glottis; the epiglottis was unusually long, the arytenoid cartilages were aspirated whereby the lumen of the larynx was constricted, and the lax mucous membrane forced into the air-current, causing the stridor. From these observations it would appear that the cause of stridor congenitus of infants is not always the same.

All authors endorse the advantages of direct laryngoscopy for diagnosis in diseases of the larynx in children. By its aid we can recognize the frequently occurring chondritis nodosa; diagnose and treat congenital membranes (Edmund Meyer), and in doubtful cases differentiate between subglottic laryngitis, the so-called pseudo-croup of children and genuine diphtheria of the larynx. Many pediatricians now make serum injections in suspected cases of larynx diphtheria. We insist that in doubtful cases direct laryngoscopy be employed to aid in diagnosis so that the prophylactic use of serum injections may be curtailed. According to our present view of anaphylaxis and its dangers, the possibly unnecessary prophylactic use of serum may make it impossible to use a subsequent imperative serum.

The disposal of papilloma of the larynx in children by this method has justifiably gained the most recognition, for we have heretofore had no such effective method. Formerly, especially in

marked development of the growths, tracheotomy was imperative: now we can usually get along without it. Even in children with marked stenosis can now be operated by the direct method without previous tracheotomy. The toleration of the child's larynx to operative measures might also be observed; even after active curettement in the subglottic area no reactive swelling was observed. We have at hand the data of 17 cases treated by this method. Von Eicken, Garel, Guisez, Halsted, Jackson, Kelly, Edmund Meyer, Schmiegelow, Waller, Wildenberg and many others recommend this procedure. To determine the cause in the more difficult cases of intubation in children the direct method has been often advantageously used. In the frequent cicatricial stenosis following diphtheria it is possible only by the direct method to find a lumen and to begin from here the dilatation treatment. In laryngeal stenosis Mosher recommends intubation by direct laryngoscopic route after cutting through the membrane with a urethrotome.

The significance of the direct method in the treatment of foreign bodies in the larynx will be discussed later.

While autscopy has become indispensable in children where indirect laryngoscopy cannot be used, it is less frequently indicated in adults. Even though direct laryngoscopy is possible in every case, especially since the introduction of Brünings's counter-pressure device and Killian's grooved depressor, yet for diagnosis only the indirect method should be applied, because it is less unpleasant to the patient and is always certain of result. The cases in which indirect laryngoscopy fails and the direct method is successful, are very rare. Von Eicken reports a case in which examination with the laryngoscope was impossible on account of ankylostoma, but where he easily introduced a thin tubal spatula through the opening of a missing tooth.

Brünings recommends the direct method in cases where the laryngoscope affords an incomplete view because of pathological deformities, swellings, and neoplasms of the epiglottis. Even here the old method may be applied (Epiglottis elevator). The direct method is of great value for the accurate topographic demarcation of malign tumors. Indirect laryngoscopy is occasionally insufficient, for it is often surprising after laryngo-fissure to note the unusual extension of the tumor. By direct laryngoscopy the extension of a carcinoma may be easily ascertained; following such examination we can determine whether extirpation or laryngo-fissure is indi-

cated, which may be of great advantage in obtaining the consent of the patient for more radical interference. Jackson points out the advantage of the direct method in obtaining sections for microscopic examination in malignant neoplasms.

The examination of the posterior wall of the larynx is also made easier. We can determine whether a tubercular infiltration has become ulcerated much easier by direct method than by means of the laryngoscope, where even in the Killian position the picture may be uncertain.

Those not thoroughly familiar with indirect laryngoscopy would do better to use the direct method for anesthetizing the larynx. I have often noticed in my classes in bronchoscopy, where non-specialists frequently participate, that they were awkward in the use of the laryngoscope, but found little difficulty in anesthetizing the larynx by the direct method.

Whether direct or indirect method should be applied in operative procedures in adults is largely a matter of personal choice. Those who are expert in endo-laryngeal operative technic will scarcely be induced to use the direct method; the beginner, however, will find it easier to operate by the direct method and with greater safeguard to the patient. The autoscopic toleration of the patient is also an important factor. If this is favorable, there is no more unpleasantness to the patient by the direct method than by laryngoscopy—Guisez and others recommend the direct method for the removal of growth from the anterior commissure. In these cases considerable pressure is necessary, a disagreeable experience to the patient, even with the applications of Brünings' counter-pressure device by which a reduction of from 40 to 60 per cent pressure is obtained. With Reichert's epiglottis elevator we may also dispose of the question of growth in the anterior commissure by the indirect method. Jackson, von Eicken and Brünings recommend this method for galvano-caustic work. We confirm its value especially in galvano-caustic puncture of the posterior wall.

Extensive incisions of phlegmons and abscesses may be more easily made by this method.

Operations in the larynx by the natural route with narcosis have been made possible only by autoscopy. Brünings has constructed a special autoscope with counter-pressure device for these operations, affording a large visual field. The advantage of the direct operation consists of the ability to maintain a clear field of vision and the control of hemorrhage. Even extensive operations may be completed in one sitting.

Von Eicken recommends direct laryngoscopy as a diagnostic measure for motor disturbances of the vocal cords. Jackson and Edmund Meyer do not advocate this measure for the recognition of motor paralysis, as autoscopy frequently produces forced positions of the cords. I believe that such forced position will not occur if anesthesia be cautiously applied, and confirm with v. Eicken the possibility of an exact diagnosis of slight paresis by the direct method.

The electric, faradic and galvanic treatment of the larynx by the direct method is recommended by Jackson.

Brünings advocates autoscopic Roentgen treatment of larynx tuberculosis, but as yet no apparent results have been produced. He also emphasizes the didactic value of direct pictures of the larynx. It is an advantage to be able to demonstrate the findings of the larynx to a large number of students in a way comfortable to the patient providing he is tolerable to autoscopy.

From this report it may be seen that only in the rarest cases is there an absolute indication for direct laryngoscopy, especially in adults, as the old method suffices.

Absolute contra-indications are just as rare. A patient who tolerates autoscopy with difficulty also presents a relative contra-indication. Direct autoscopy should also be avoided in cases of affections of the base of the tongue. The point of contact of the tubal spatula being here, this method of examination should not be used in cases of ulcerations, infiltrations and tumors of the base of the tongue. Care must be taken in all advanced cases of stenosis of the larynx. Here even the anesthesia of the larynx is contra-indicated because of great danger of suffocation.

If direct examination is undertaken in advanced laryngeal stenosis, all preparations must be made for an emergency tracheoscopy, or a very small tracheoscope for rapid introduction into the trachea, must be on hand.

Direct laryngoscopy *per se* is not dangerous. The pressure of the spatula may produce small epithelial abrasions, erosions, especially in children, yet these are not of more importance than those frequently occurring in indirect laryngoscopy. Jackson reports two deaths following direct laryngoscopy; these, however, must not be ascribed to the direct method. In one, a child, death took place three hours after operation and due to cocain toxemia; the other, a man, died of gangrenous pneumonia following chloroform aspiration, a case of direct operation in the larynx, with general anesthesia.

The introduction of direct laryngoscopy has certainly enlarged our field greatly; we must perfect ourselves thoroughly with this technic because it is so distinctly a factor in the examination of the trachea and bronchi.

The influence of direct tracheo-bronchoscopy in the diagnosis and treatment of foreign bodies in the deeper air-passages is already generally recognized. Diagnosis of foreign bodies has been made possible only since the introduction of the direct method. In only 7 per cent of the cases thus far published was it impossible to locate the foreign body bronchoscopically, and this perhaps owing to faulty technic or unsatisfactory instruments; in the last two years only 2 in 291 cases have been reported (0.7 per cent), in which the foreign body could not be located; in 1905 there were as yet 11.5 per cent of the reported cases with faulty diagnosis (Gottstein).

The other methods of examination must not be forgotten. We still find many advantages in them, as, for example, in Röntgenology; even if the foreign body cannot be seen by this means, we are still able to acquire valuable data from the varying positions of the diaphragm, the Jacobsohn-Holzkecht phenomena, etc.

For the therapy of foreign bodies the direct method has accomplished wonders, and those of us who have successfully removed a foreign body endoscopically from the bronchial tract, must feel surprised at the ease with which it has been accomplished, the simplicity of instrumentation, and must join in gratitude and appreciation to those who have established this method.

Esophagoscopy, introduced a decade later as a clinical method, has not been as extensively developed for the treatment of foreign bodies as has tracheo-bronchoscopy. This is probably due to the fact that we have had other fairly successful methods for the treatment of swallowed foreign bodies, before the advent of esophagoscopy.

The therapeutic results in the matter of foreign bodies in the deeper air-passages, especially those of the bronchi, were, prior to the introduction of bronchoscopy by Pieniazek and Killian, very unsatisfactory. Even the development of modern surgery of the thorax effected no improvement. Tuffier, in 1897, reported 11 pneumotomies for foreign bodies, in 10 of which the foreign body was not found; in 4 cases the operation was fatal; Karewski, in 1903, reports 14 thoracotomies for foreign bodies with only 2 successful results. It is therefore not surprising that various authorities advised an expectant therapy in the treatment of foreign bodies in these areas. Weist advised, in a review of 1,000 cases, if no

dangerous symptoms or evidences of stenosis arose where foreign bodies were fixed in the trachea or bronchi, that no operative interference be undertaken and that we wait for spontaneous expulsion. That this viewpoint is not permissible considering the relative infrequency of spontaneous expulsion, admits of no further discussion. The statistics of Preobraschenski and Pohl show 218 of 1,064 cases (20.5 per cent), excepting perhaps the small number of cases of encapsulated foreign bodies.

The mortality in aspirated foreign bodies was formerly an awful one. Preobraschenski records 52 per cent in 770 cases in which no treatment was instituted. This percentage would be increased if there be added the many patients who died of lung complications caused by undiagnosed foreign bodies. This mortality has been diminished since the discovery of the laryngoscope, and the consequent improvement in the therapy of foreign bodies in the larynx. In the pre-laryngoscopic period the mortality was 41.2 per cent; since then, from 1866 to 1891, it was reduced to 30 per cent. In the next decade to 1901 it was reduced still further. Pohl, who continued the statistics of Preobraschenski, found in the literature of 294 cases a mortality of 15 per cent. If only the treated cases (530) in the above series are considered, a mortality of 20.8 per cent is found from 1890 to 1901.

The introduction of bronchoscopy has produced a marked improvement in these statistics. The monographs of von Eicken (1901), Gottstein (1905) and Killian (1907), present a clear idea of the value of this method for aspirated foreign bodies. That bronchoscopy has not yet been given sufficient publicity, however, is evidenced in the following report of Jackson: In a post-mortem performed in 1909, on a child whose death had followed a foreign body in the bronchus, the anatomist called the attention of the attending surgeon to bronchoscopy; whereupon the surgeon asked: "What is bronchoscopy?"

At the last international congress in Budapest, v. Eicken presented extensive data concerning bronchoscopic foreign bodies, including the literature to the beginning of 1909. I have, therefore, collected only the cases published in the last two years and the data personally sent me by colleagues.* A comparison of these statistics with those of v. Eicken will give us a better idea of the status of bronchoscopy of to-day in the matter of foreign bodies, for we are no longer handicapped by failures dependent on insufficient or unsatisfactory technic.

*I desire to acknowledge with thanks the numerous personal reports sent to me by my colleagues.

The rapidity with which bronchoscopy for the treatment of foreign bodies gained popularity is seen in the following figures: prior to 1896 there were but 5 cases reported; 19 in 1900, 36 in 1904, 137 in 1906, 165 in 1907, 304 in 1909. I collected 291 case reports from 1909 to 1911, making a total thus far of 595 cases. Doubtless many more cases have occurred, as the larger number of laryngologists now perform bronchoscopy and many simple, uncomplicated foreign body extractions remain unpublished.

Of the 304 cases collected by v. Eicken, 40 (13.1 per cent) terminated fatally. This is a decided reduction in mortality when compared to the pre-bronchoscopic period. In the past two years a further reduction of mortality is noted. Of my 291 collected cases there were but 27 (9.6 per cent) fatalities. Of these 27 cases, 17 died of lung complications; in 7 of these it was found impossible to remove the foreign body; in 5 cases shock, cocain and chloroform toxemia caused death; one child died of anonyma-errosion; one child was asphyxiated due to subglottic swelling, and in one case edema of the brain was found in autopsy; two cases were due to accidental circumstances: one to suicide, one to plugging up of the cannula.

Lung complications are still the most frequent cause of death. If these cases could be seen earlier, even this mortality cause might be lessened. Death from anesthesia (cocain, chloroform) and from shock should not really be attributed to bronchoscopy, as these conditions occur in all other operative procedures, and but relatively seldom in bronchoscopy. (In v. Eicken's statistics 5 cases; in mine of the last 2 years, 4).

In the statistics of v. Eicken there were 34 cases (11 per cent) of failure to remove the foreign body. Of the 291 cases collected in the last two years only 13 (4.5 per cent) were unsuccessful, a substantial evidence of improvement in technic and instrumentarium.

Extraction was successful in 276 cases in the first sitting; in 7 cases several sittings were required; in 2 cases no foreign body was found; in 9 cases the foreign body was coughed out during the operation. In acute or recent cases extraction is more easily accomplished. The exception to this rule are permeable substances, cereals, especially beans; Nehr Korn first called attention to this danger. Unless such a foreign body is extracted promptly after its aspiration, it soon becomes so wedged in that it cannot be removed without breaking it in pieces, and herein lies the danger of aspirating some of these particles into the smaller bronchi and causing subsequent pneumonia.

Extraction difficulties, especially in chronic foreign body cases cause large mucus or pus accumulations. Freudenthal reports a case where, because of the profuse mucous accumulations and his objection to the aspiration-pump, he used a fluoroscopic screen as an aid in extracting the foreign body, and recommends this accessory. Huber removed a brass nail from the right bronchus by aid of radioscopy. Granulations and stenoses offer serious difficulties. It is even possible to overcome the great handicap of removing foreign bodies lodged behind a stenosis, as may be seen in the well-known, classic case of Killian and Brünings of systematic dilatation of a stenosis and removal of a small nail (paperhanger's nail) after the twelfth sitting.

When a foreign body has got beyond the bronchial tree, the limit of bronchoscopy is reached, and thoracotomy must be employed, possibly in combination with bronchoscopy. By such a combined method Hofmeister succeeded in removing a collar button from the right lung.

Where a foreign body is firmly wedged or stuck in the bronchial wall, great care must be used in its extraction to avoid injury to the bronchial tract and consequent emphysema. The technic has now been so perfected that a transversely-fixed needle can be cut in two pieces in situ and each piece separately removed (Casselberry). Direct laryngoscopy is comparatively but seldom used for the removal of foreign bodies, as the indirect method is effective in most cases. In v. Eicken's statistics we find 13 cases; in my statistics, 14 cases. It is interesting to note the relative frequency of upper and lower tracheo-bronchoscopy; upper bronchoscopy is more often employed. Until 1909, upper bronchoscopy was used 109 times in 233 cases (46.7 per cent); since 1909 it was used 180 times in 254 cases (70.8 per cent) where the variety of bronchoscopy was indicated. In 64 cases lower bronchoscopy was employed, and 14 of these were subsequent to the use of upper bronchoscopy.

In small children upper bronchoscopy has recently been discountenanced and immediate tracheotomy urged, as here upper bronchoscopy is rarely successful. Statistics, however do not confirm this, as upper bronchoscopy was successfully used in 67 cases of children under 6 years of age; in only 30 cases was lower bronchoscopy necessary; even in nursing infants the upper method is applicable. Probably the youngest child thus treated was one of my cases, a boy, 6½ months old, in whom upper bronchoscopy was used with a tube 7 mm. in diameter for the extraction of a bone

from the left bronchus, without necessitating subsequent tracheotomy. The upper method has been successfully used in 11 out of 18 children under one year of age. There is but little danger of subsequent tracheotomy, as only 16 tracheotomies and 2 intubations were required in 595 cases.

Subglottic swellings occur only after protracted tracheoscopic examinations. In three cases, following the successful extraction of the foreign bodies by means of upper bronchoscopy, tracheotomy was necessary on account of increasing stenosis; in each of these children the operation was of more than one-half hour's duration.

In regard to the indications and contra-indications for bronchoscopy of foreign bodies, we may say that in each case of aspirated or suspected aspirated foreign bodies, the direct method is indicated. In acute cases, especially in permeable bodies, delay is dangerous, and lung complications must be avoided by rapid removal of the foreign body. Even high temperature is no contra-indication.

This is evidenced by the successful extraction in cases where severe pneumonia existed. The question is: when is upper and when is lower bronchoscopy indicated? We cannot endorse the opinion of many authors that the lower method should be always used in children under 4 years of age. The lower method is indicated, however:

1. In cases of severe stenosis, especially when tracheotomy seems unavoidable. In lower tracheoscopy we can more easily dispense with narcotics, which is contra-indicated in dyspnea.
2. In all acute cases where upper bronchoscopy has failed after ten minutes' attempt.
3. In chronic cases in children under 6 years of age, in whom the first trial has been unsuccessful, because repeated manipulations in upper bronchoscopy may easily produce subglottic swelling.

In adults a repetition of upper bronchoscopy may safely be undertaken; for this may be easily done under local anesthesia.

4. Where unsurmountable difficulties exist, such as intense irritability of the patient, ankylostoma, etc.
5. Insufficient skill or incomplete instrumentarium.
6. Where tracheal fistula previously exists.

Under no circumstances should we be induced to use the more elegant method of upper bronchoscopy in any of the above series of cases. As soon as more serious difficulties arise in the extraction of foreign bodies, the lower method should be used.

Direct tracheo-bronchoscopy in the treatment of the tracheo-bronchial tract is less frequently employed than in the treatment of foreign bodies; there are still many internists who are disinclined to acknowledge the value of this method for such therapy. Bronchoscopy, however, contributes much toward the diagnosis of primary affections of the tracheo-bronchial tract, and also of those affections of the adjacent organs, recognized by displacement or compression of the tracheo-bronchial tract. We occasionally observe congenital anomalies on the dissecting table and these may be more clearly brought out by the direct examination. I have observed two cases of congenital diverticular (rudimentary bronchi, as understood by H. Chiari).

In inflammatory affections of the trachea and bronchi, endoscopy has been advantageously applied. The work of Ephraim on endo-bronchial treatment of chronic bronchitis must here be mentioned: in 19 bronchoscopically examined cases he found a narrowed lumen of the bronchi due to swelling of the mucous membrane; during expiration this swelling increased; while coughing there was complete closure. He assumes that a retention of secretions is hereby produced whereby recurrence of inflammation takes place; by spraying and pencilling novocain and suprarenin and in some cases weak solutions of silver nitrate he produced a marked improvement after single application in 14 out of 19 cases, persisting for months. Goldbach cites a case where bronchoscopy showed an edematously reddened membrane which was promptly cured by pencilling with a 2 per cent solution of copper sulphate. The number of cases treated is as yet too small to designate bronchoscopy as a therapy for chronic bronchitis; further research in this direction is certainly desirable.

In a case of bronchiectasis Ephraim obtained decided improvement by installations of H_2O_2 , especially a decrease of secretions. H. v. Schroetter has also used bronchoscopy in bronchiectasis and suggested endobronchial therapy. Endoscopy is advisable in such cases if only to exclude the presence of a foreign body as the cause of the bronchiectasis; examination in these cases, however, is sometimes difficult. The profusion of secretions often makes it impossible to obtain a clear endoscopic view; in such cases it has been found advantageous to "place the patient on his head" previous to the endoscopy and it is surprising what great quantities of mucus are thus coughed up.

A number of cases of small, catarrhal ulcers of the trachea have been observed. Jackson promptly cured a non-specific ulcer at the

bifurcation, which had caused chronic cough, by six direct pencillings with silver nitrate; a second case of ulceration at the bronchial bifurcation was diagnosed and treated by him. A similar case is reported by Goldbach. Direct examination is recommended in cases of trachitis with intense local pain; catarrhal ulcers may often be found as etiological factors and prompt cure effected by local treatment.

By means of bronchoscopy the cause of an indefinite hemoptyses may be ascertained. Thus Killian found, by endoscopy, the source of hemorrhage in a bronchial branch in the upper lobe in a case of cancer of the lung. Ephraim found, in two cases of hemoptysis, bronchial tumors as the cause of hemorrhage. In Chiari's clinic the cause of a chronic bloody cough in a female patient was found to be a small varix in the right wall of the trachea; the hemoptysis stopped after galvano-cauterization of this varix. Ephraim recently published a similar case. The locality of gangrenous foci and abscesses in the lung may be determined by endoscopy. H. v. Schroetter observed pus exuding from a gangrenous abscess into a bronchus of the third degree in the lower lobe of the lung, and thus corroborated the results of the physical examination.

Endoscopy gives great promise in the treatment of bronchial asthma. As Stoerck observed that the larger bronchi and the trachea participated in these asthmatic attacks, we may assume that endoscopy would be a serviceable agent. In the majority of cases of asthma examined endoscopically a normal condition was found. Pieniazek, who was the first to make an endoscopic examination during an asthmatic attack, found both bronchi markedly congested and considerable stenosis in the smaller bronchi; this was probably a case of asthma complicated with acute bronchitis. Ephraim found a normal picture in two cases of asthma examined endoscopically during an attack. H. v. Schroetter observed in one case a distinct narrowing of the right main bronchus; this appeared with a ring-like constriction and the diameter of the bronchus did not expand on inspiration.

In 14 of 26 cases of asthma examined endoscopically in the interim between attacks, Ephraim found normal conditions in the bronchial tract; in the other cases there were changes which he attributed to the concurrent bronchitis. The number of cases thus examined is not yet large enough to determine this question, but it may be definitely stated that the large bronchus need not necessarily be involved in an asthmatic attack.

I examined 6 cases of bronchial asthma and was unable to find any gross change in the bronchial tract endoscopically. These examinations were not made during asthmatic attacks, but in all cases a slight stenosis could be determined.

Bronchoscopic treatment of asthma has produced surprisingly good results. Pieniazek, Nowotny, Galebsky, Horn and Tretrop reported successful treatment of cases of asthma by bronchoscopy. Of 58 cases of severe asthma treated bronchoscopically by Ephraim, 37 were cured, 14 improved, and 7 were unimproved. The treatment consisted of single or repeated endo-bronchial spraying with cocain-adrenalin solution, or similar preparations preferred because of their less toxic qualities. What the real component is in this bronchoscopic treatment is still an open question. Nowotny considers the profuse expectoration as the cause of improvement; Ephraim points out the value of the mechanical dilatation of the tubes (compared to esophago-spasm) and especially the active factor of anesthetization and blanching of the mucous membrane by the instilled medicament. Ephraim's large series of reported cases, results and observations controvert the theory of suggestion as the only factor of improvement, as has been claimed by some. Ephraim is now making observations with bland fluids, and his results will no doubt soon throw further light on the subject.

In dry catarrh of the larynx and trachea, as it frequently occurs in influenza-epidemics, there are frequent crust-formations which lead to severe stenoses, that may demand tracheotomy. In cases where inhalation and instillation has been ineffective in loosening these crusts, the direct method has proved of service and avoided the necessity of tracheotomy.

In ozena we occasionally observe an involvement of the trachea. Interesting observations in ozena cases were made by Mann, Levinger and Muckleston. They found multiple osteomata in the trachea; yet pathologic-anatomic data prove that tracheal osteoma may occur without ozena, and the above observations may be simply a circumstantial association. It is significant, however, that in all endoscopically observed cases thus far, osteom-formations has been found simultaneous with ozena.

Direct examination has often been made in diphtheria of the trachea. Pieniazek, v. Eicken and Nager have removed the adherent membrane tracheoscopically in children with descending tracheal croup and thus saved them from asphyxia.

Specific inflammations of the tracheo-bronchial tract have been revealed to us in their clinical aspects only since the advent of the

direct method. The participation of the trachea and its branches in chronic, specific, inflammatory processes was formerly regarded as a rarity, seen only in autopsy; to-day we recognize it as not infrequent. Tuberculosis of the trachea occurs but seldom. Jackson and v. Schroetter only report such cases. The one case of v. Schroetter is especially interesting, as he succeeded by systematic use of bougies, in permanently reducing the stenosis produced by proliferating infiltration, a procedure possible only by aid of the direct method. In the later stages of laryngeal tuberculosis the trachea is also often involved, but in these cases the condition of the larynx contra-indicates direct examination.

Tertiary syphilitic affections of the tracheo-bronchial tract are more frequent than formerly supposed. We have a record of 13 cases. H. v. Schroetter observed 12 cases of luetic affections of the trachea and bronchi. Jackson, Novotny, Mahler, Kohn, Killian, Neumayer, Garel, Tillgren, Newcomb, Halsted and others also discuss the value of the direct method for the diagnosis and treatment of syphilis of the lower respiratory tract. Clinically two stages have been observed: (a) recent gummatous infiltrations and ulcerations; (b) changes produced by secondary cicatricial contractions. Gummatous infiltrations, especially in the early stage, were formerly difficult of diagnosis. The early diagnosis of this condition is of especial importance, because prompt treatment in the majority of cases will prevent the frequently dangerous cicatricial stenosis. The symptoms of gummatous affections of the tracheo-bronchial tract are very insignificant in the early stage. The patients complain of slight pressure and occasionally some cough; evidences of marked stenosis may appear suddenly. Where there is the slightest suspicion of a gummatous infiltration, direct examination should be made. That we will thus frequently stumble on gummata of the tracheo-bronchial tract is shown by our experience in the Vienna clinic, where 8 cases of fresh gummatous infiltrations were observed in 3 years; several of these patients had been under treatment for some time for tracheitis and bronchitis, and the diagnosis was correctly made only after bronchoscopy. If no extensive ulceration has taken place, active anti-luetic treatment will produce a *restitutio ad integrum*. Even in circumscribed infiltration no cicatricial stenoses will then occur.

In recent gummatous infiltrations bronchoscopy has made possible an earlier diagnosis; in cicatricial stenosis bronchoscopy has become indispensable as a therapeutic agent. H. v. Schroetter has made extensive observations in this field. In 4 cases he obtained

marked improvement and cure by systematic bronchial dilatation. One case was satisfactorily treated by the insertion of permanent cannulae. Cicatricial stenosis of other etiology is naturally also amenable to endoscopic dilatation treatment. The well-known case reported by Killian and Brünings of dilatation in a foreign-body stenosis is such an example; Kan also reports a similar case. Great care must always be taken to avoid injury or the forcing of false passages, because of the rigidity of the cicatrix; not every case of cicatricial stenosis yields to bronchoscopic treatment. A patient in our clinic who had a luetic stenosis in the lower tracheal tract, had such an active reaction and high fever after each treatment that endoscopy had to be discontinued.

The discision treatment of cicatricial stenosis of the trachea is not to be recommended, but the same treatment in cicatricial stenosis of the esophagus has been very successful. Pieniazek observed a case in which discision treatment was undertaken for a cicatrix at the entrance to the right bronchus, the passage of air into the mediastinum and emphysema of the skin.

Scleroma is occasionally localized in the trachea and bronchi. The advantages of tracheo-bronchoscopy in the diagnosis and treatment of tracheal scleroma may be found in the reports of the Krakauer clinic (Pieniazek, Baurowicz, Novotny) where the greatest amount of sclerom-material is to be found. Single cases are also reported by Emil Mayer, Link and Ronthaler. We have observed 10 cases. We divide scleroma, like syphilis, into two stages: (a) recent infiltration; (b) cicatrized, shrivelled infiltration, which often produce the most severe stenoses. In recent luetic infiltration every dilatation or operative treatment is contra-indicated, because cure may be obtained by general treatment; in recent sclerom-infiltration, bronchoscopic therapy may be advantageously employed. The soft granulations may be curetted, reduced by pressure or removed by forceps; after a short period of treatment, definite improvement may be observed. Scleromatous cicatricial stenosis is more easily dilated bronchoscopically than the luetic form; we have observed one case, however, in which the trachea and bronchi were changed into a rigid and osseous-like tube of smallish lumen, produced by scleromatous infiltration and cicatricial shrinkage. This stenosis resisted all efforts at dilatation. Direct Roentgen treatment, as used by Brünings in tuberculosis, might perhaps be employed with better prospects in scleroma, since Röntgen therapy has been known to be of value in scleromatous affections.

Von Eicken has emphasized the importance of tracheoscopic examination in all cannulized patients. The first tracheoscopic examinations were made by Pieniazek and Schroetter for the removal of granulations in such patients. We frequently find in patients who wear an ill-fitting cannula, decided decubital ulcerations, granulations, or necrosed cartilage, which might have been avoided by a properly chosen cannula. Formerly we were obliged to try out a cannula; we could not determine at which point the cannula touched the tracheal wall and thus caused the above difficulties; all of this is remedied by the direct examination. In future hemorrhage from erosions of the anonyms due to cannula-decubitus, not uncommon in children, may be avoided. We should, as a routine, convince ourselves by direct inspection of the trachea on the day following tracheotomy, whether the cannula is well-placed and whether causing irritation of the tracheal wall.

In difficult decannulization due to crust-formations, subglottic welts and membranes, the so-called retrograde laryngo-tracheoscopy as recommended by Sargnon may be of therapeutic value.

Primary tumors of the lower respiratory tract have sometimes been found and satisfactorily treated. Here the value of bronchoscopy is again emphasized; before the advent of endoscopy tumors in the upper-air tract were accessible, but tumors in the deeper areas of the trachea and bronchi were then inaccessible and no form of topical treatment possible. Killian was the first to remove a sarcoma by means of direct tracheoscopy and the galvano-cautery snare; there was no recurrence. Papillomata in the air-passages have been removed by the direct route by Goldschmidt, Edmund Meyer and Jackson. Killian removed an intra-tracheal struma; Guisez, Spiess, Waller and Sauer removed fibrous polypi; v. Eicken removed an echondroma from the bronchus in the left lower lobe; in the Vienna clinic 5 cases of primary tracheal tumors were treated. In one of these cases with intense dyspneic symptoms I found a papillary-cylinder-carcinoma protruding into the right bronchus and spreading beyond the tracheal bifurcation to the left bronchus, partly occluding it; I was enabled to remove this neoplasm by means of the galvano-caustic snare via direct method, and apparently effected a cure after scarifying the base of the growth with the galvano-cautery; there has been no recurrence in $2\frac{1}{2}$ years. In another case, a woman was examined tracheoscopically for stenosis due to struma because the tracheal stenosis determined by indirect examination did not explain the intense dyspnea; we found a tumor of the right bronchus, which, on removal, proved to be a

squamous-celled epithelioma. In another interesting case, examined by direct tracheoscopy, I found a tumor filling the entire right bronchus; in the night previous to the operation, the patient coughed up the tumor-mass, (the size of a thumb); it had its origin in the bronchus of the right lower lobe, as revealed by bronchoscopy; this growth recurred, notwithstanding the removal of the pedicle and application of the cautery; it was a myxo-sarcoma. Even if some of these cases cannot be cured by the direct method, we may, at least, greatly ameliorate the distressing symptoms.

From our observations and the literature we are justified in assuming that the primary affections of the tracheo-bronchial tract are more frequent than formerly supposed. In many cases much may be accomplished by early diagnosis; in cases of long-standing tracheitis, bronchitis and dyspneic conditions direct examination is urgently recommended so that other affections may be excluded.

Not only the primary affections of the tracheo-bronchial tract but also changes in the adjacent tissues may be diagnosed by the direct method. Wild's valuable report of 700 cases of the significance of tracheoscopy in struma is of great interest. In struma stenosis, indirect examination and the X-ray may suffice in the majority of cases, yet there are cases where additional data are obtained by direct tracheoscopy, as for example, in multiple twists in the trachea. The X-ray reveals only the lateral compressions; in anterior or posterior compressions it is useless. In malignant struma, direct tracheoscopy may aid us in deciding whether to operate or not. We can determine whether the tracheal wall has been penetrated. In cases where the indirect method fails because of abnormal position of the larynx or paralysis of the vocal cords, the direct method must be used. By endoscopy alone can we determine whether the struma stenosis only is the cause of the dyspnea; in the previously recorded case from our clinic and in two cases recently reported by Ephraim, the dyspnea was due to contraction of the deeper areas of the trachea and bronchi.

An enlarged thymus may also produce a compression-stenosis of the trachea. Jackson observed a bulging of the anterior wall of the trachea in a four-year-old boy with tracheal occlusion, a condition possible only from an enlarged thymus. In the cervical part of the trachea, compression may also be caused by retro-pharyngeal or vertebral abscess (Körner, Pieniazek).

In pathological conditions of the esophagus, the posterior tracheal wall is sometimes involved and these affections may be diagnosed tracheoscopically. Hirschland reports an esophageal ab-

scuss ruptured into the trachea in a case of carcinoma of the esophagus penetrating the tracheal wall. These secondary ruptures are usually found in the cervical area of the trachea and the diagnosis can be made by aid of the laryngeal mirror; in two cases, however, the rupture was found at the bifurcation; endoscopic removal of the growths temporarily improved respiration.

Direct tracheoscopy may also be of service in the treatment of enlarged lymphatics causing stenosis of the cervical area of the trachea. It is worthy of mention that the majority of patients with stenoses experience great relief after tracheoscopy; this may be due largely to the effects of cocain-adrenalin on the inflamed and swollen mucosa or possibly to the mechanical dilatation. Ronthaler reports improvement following repeated tracheoscopy in a case of tracheal stenosis produced by pseudo-leucemia lymphatica cervicalis.

The diagnosis and treatment of diseases of the peri-tracheal and peri-bronchial glands has received renewed impetus through tracheo-bronchoscopy. Compression of the trachea by anthracoid lymph-glands has been noted by Mann and Schroetter. Schroetter observed a case of stenosis of both main bronchi due to anthracoid and partly calcified lymph-glands. Sternberg observed that perforation frequently follows such anthracoid lymphatics. In 6,132 autopsies he found 32 cases of perforations and considers such ruptures the most frequent cause of gangrene of the lung in the aged. If it were possible to diagnose such lymphatic before their rupture, the employment of endoscopy would then prevent such complications.

Tubercular diseases of tracheo-bronchial glands which occur so frequently as severe symptoms in children, are of greater importance. The diagnosis as has been indicated, especially by Bloomenfeld, and Koehler, is also possible by Röntgenology. Others as Czerny and de la Camp do not consider Röntgenology of much value. The other methods of examination are not reliable (Breton, Meisser, Petruschky, Schmidt).

A diagnosis is always readily made by means of the direct method as soon as the glands have been enlarged sufficiently to produce compression. Ephraim has called attention to the fact that a bronchoscopic diagnosis is even occasionally possible before stenosis-symptoms appear. He observed in two cases with protracted cough the cause of which could not be determined after repeated examination an extension of the "carina" and at the bifurcation of the bronchus a marked change. The spur was not sharp as usual, but round and flattened; the mucous membrane was succulent. In both cases the diagnosis was soon verified by the appearance of pulmonary

affection. I was able to find a similar extension of the "carina" in the examination of two children: A diagnosis of tuberculosis of the bronchial glands was verified by Röntgenology. The direct method may be life-saving in perforations of broken-down glands in the tracheo-bronchial tract. This condition is not uncommon. Most frequently the softened particles are coughed up but occasionally they are aspirated, rapidly producing a fatal pneumonia or asphyxiation. In these cases bronchoscopy is also of little service. Ephraim emphasizes the fact that there are frequent premonitory symptoms of perforation: cough, severe dyspnea, asphyxiation attacks and coughing up of particles of tissue must be an index for the employment of the direct method. Operative measures were used in these cases in former times but they were not very successful. Tracheotomy was performed and then the obstructing mass blindly removed through the tracheotomy wound. It is self-evident that only through such a well-directed method as tracheo-bronchoscopy is a successful result possible. Pollak was the first to observe by inferior tracheoscopy in a four-year-old boy, the perforation of a gland in the trachea. Paunz and Winternitz have had a wide experience; they diagnosed and removed broken down peri-bronchial lymph-glands in the cases of five children. Schmiegelow also reports a similar case. It is urgent to treat these cases before perforation takes place. At this stage it is easy to tap and aspirate the bulging pus-filled glands and to remove possible cheesy masses by excochleation. Even in the presence of broken-down glands, endoscopic treatment of the abscess-cavity is of advantage in guarding against a further aspiration of the gland-particles. Of course, operative intervention is only then indicated if we are positive that the bulging is surely due to enlarged glands. Pieniazek excochleated a bulging tumor located in the lower portion of the right tracheal wall, believing it to be a broken-down bronchial gland. After a few days, however, the patient died of hemorrhage; it had been a case of aneurysm, but the walls were thick, which prevented pulsation being felt and led to a wrong diagnosis.

Compression of the tracheo-bronchial tract due to enlarged luetic glands can be entirely cured after specific treatment. In two cases I observed the slow retrogression of the stenosis after specific therapy.

Under tumors of the mediastinum I should first treat dermoid cysts, but thus far no such case has been bronchoscopically examined. In two cases of lymph sarcoma of the mediastinum, H. v. Schroetter diagnosed by means of direct tracheoscopy an extensive

stenosis in the lower tracheal branch. Mann also observed several mediastinal tumors. I myself observed a medullary carcinoma surrounding the lower portion of the trachea. Tracheoscopically a sabre-sheath-like stenosis was apparent. Bilateral compression is a differential diagnosis for mediastinal tumors as opposed to aneurysm. In the latter case the bulging tumor is unilateral, while in the thus far observed tumors of the mediastinum the growth encircled the air-passage and thus caused bilateral compression. The lumen may, however, be frontal, as in one of v. Schroetter's cases. In one case of mediastinal tumor Ephraim found a marked extension of the bifurcation and takes this symptom—which Mann also observed in his cases—as a differential sign as opposing a diagnosis of aneurysm.

As early as 1906, Killian pointed out that aneurysms of the aorta could be much earlier diagnosed by tracheo-bronchoscopy. Röntgenology often fails in incipient cases. Upon one occasion a positive diagnosis of aneurysm was tracheoscopically made after negative Röntgen finding. Guisez also reports a similar case. The aneurysm-picture is a variable one. I have observed a large number of cases, over 20. Most often the tumor-like bulging is visible laterally or posteriorly at the seat of the aneurysm at the arch of the aorta or in the descending portion. Nevertheless an isolated compression of the left bronchus is also often found. In aneurysm of the aorta ascendens and anonyms compression on the right side is found. Twice I made a wrong diagnosis of mediastinal tumor because of the absence of pulsation and the unevenness of the wall. When there is strong coagulation in the aneurysmal sac, pulsation is entirely absent, especially if there are small openings communicating with the large vessel. Other authors also report wrong diagnoses. In addition to Pieniazek's case already mentioned, v. Schroetter's case is of interest. A fatal hemorrhage set in after the excision of a portion—for diagnostic purposes—of what he assumed to be a tumor of the bronchus. Autopsy revealed an aneurysm. This instance shows, as v. Eicken emphasizes in his last treatise, that we must be very careful in excising pieces of tumors in the lower trachea for diagnostic purpose. Most authors warn against direct examination in aneurysms or suggest only an examination from above. One must avoid approaching the stenosis. If the tracheal wall is still intact, the stenosis can be safely passed by taking the proper precautions; in fact, I should recommend repeated tracheoscopy in aneurysms due to severe stenosis even though the process may accelerate the nevertheless unavoid-

able rupture. If one sees the painful conditions of aneurysmal patients whose trachea is almost completely closed, one is tempted to perform tracheoscopy if one feels that this procedure will alleviate their condition at least for a few hours, even though there is danger of an eventual premature perforation. The relief experienced by the patients after examination is due less to the bronchoscopic dilatation than to the effect of the cocaine and adrenalin upon the swollen mucosa and to the relief in expectoration. Novotny and Mann have also successfully used tracheoscopy in aneurysm.

It is well known how difficult it is to make a diagnosis in certain cases of pulmonary affections. Sometimes a direct examination is of aid in such cases. Kob examined a case of pulmonary echinococcus. He observed bronchoscopically a tense, elastic tumor involving the left main bronchus; this proved to be an echinococcal cyst. The mass was punctured and aspirated, the cystic contents evacuated and an infection thus avoided by means of this simple procedure.

Carcinoma of the lung has been observed by Killian, Mann, H. v. Schroetter, etc. An histological diagnosis can be made excising a portion for further examination. Endoscopy is not necessary in the diagnosis and treatment of phthisis. Nevertheless I must mention a case of tuberculosis of the apex of the lung, observed by Killian. In an otherwise perfectly normal bronchial tract he found inflammation of the mucus and polypi in the upper lobe corresponding to the physical findings. Killian's advice to find and tamponade the cavity in pulmonary hemorrhage has not as yet been accomplished.

Von Schroetter's observations are of value in making a differential diagnosis. He noted a case of compression of the left main bronchus due to a pleuritic exudate, which disappeared after puncture.

Stenoses of the left bronchus may also be due to an enlargement of the left auricle. Inspired by the patholo-anatomical examinations of Stoerk and Kovacs, I was able to verify bronchoscopically a typical picture in twelve cases of auricle-enlargement, mainly mitral stenosis. A flattening of the protruding mass of the anterior and lower main bronchial circumference wall in an almost horizontal plane is ever apparent as well as distinct circumscribed pulsations of the lower bronchial walls. The bronchial stenosis is parallel to the enlargement of the auricle. In two cases of paralysis of the left recurrent nerve which came to our clinic because of hoarse-

ness, I could assume the above-mentioned typical findings and thus make a more positive diagnosis of mitral stenosis as a cause for the recurrent paralysis. Internal examination verified this diagnosis. Of course, such examinations should be avoided in the presence of non-compensating cardiac defects. Our investigations have shown that in a bronchoscopically diagnosed case of stenosis of the left bronchus enlargement of the auricle must be considered as a probable cause.

Direct examination can be advantageously employed in ascertaining the predisposing cause of paralysis of the recurrent. For several years I have been using this method in almost every case of paralysis of the recurrent and am thus frequently enabled to determine the cause. The before-mentioned mitral stenoses are only seldom the cause; more often it is due to incipient aneurysms, mediastinal glands, sub-sternal strumata, esophageal carcinomata, etc., all of which are easily recognized by the direct method.

The significance of bronchoscopy in the surgery of the thorax must also be mentioned. After Killian had shown, by his work on the cadaver, and on the human, that it was possible to pass a probe to the surface of the lung, Hofmeister used bronchoscopy successfully to aid in a thoracotomy for foreign body. L. v. Schroetter recommends in cases of abscess of lung and bronchiectases the introduction bronchoscopically of a bullet suspended by a cord to the focal point in order that a radiosopic localization may be possible and an external opening made. Bruenings constructed a bronchometer for such localization.

Gluck at first proposed making a bronchial fistula in cases of stenosis of the lower trachea in which tracheotomy could no longer be performed and thus make retrograde respiration possible. Spontaneous bronchial fistulae had pointed to the possibility of retrograde respiration. By means of the direct method we are now in a position to discover the indications for such a procedure. In four cases I found it advisable to perform a bronchotomy; in three cases of aneurysm and in one of mediastinal tumor. The simultaneously introduced bronchoscope made it easier for the surgeon to locate a larger bronchus. In two cases I introduced the bronchoscope during thoracotomy. In one of these cases I succeeded in passing a probe through the surface of the lung, and introduced a drain into the lower bronchus by means of a thread fastened to the probe. In the second case the surgeon could not find the introduced probe; it lay in the lower lobe, while he had access to the middle lobe—the thorax had been opened anteriorly. The interesting thing about

this case is that after the opening of the pleura all respiratory movement ceased while I externally introduced the tube—the operation was performed in Sauerbruch's office. The air was audibly sucked in through the bronchoscopic tube and respiration proceeded with respiratory movement. This procedure should be compared with the insufflation-narcosis recommended by Melzer and Auer. Mention should here be made of the experiments of Jackson and Gaub in respect to oxygen-insufflation through Jackson's aspirating bronchoscope as an aid in thoracotomy.

The results of bronchotomy have been thus far unfortunately unsatisfactory. My four cases died a few days after the operation. Of course, we must remember that the patients were already very weak as a result of stenoses of long standing. The operation should be performed in an earlier stage. Yet, as long as there are no severe symptoms of stenosis one hesitates greatly to have recourse to this procedure. An improvement in surgical technic with the aid of bronchoscopy may facilitate matters.

Killian and H. v. Schroetter recommend so-called pleuroscopy. In chronic, spontaneous or post-operative thorax-fistula, the pleura and lung may be examined from this point.

Physiology too have profited by the direct method. Bruening, Ingal and H. v. Schroetter studied the respiratory action of the tracheo-bronchial tract. The latter also studied blood-pressure, rapidity of circulation and the volume of the heart-sound in the human. The processes accompanying expectoration can be directly observed. H. v. Schroetter has undertaken an analysis of the bronchial air and a measurement of the temperature of the bronchial tract.

Before discussing the contra-indications, the dangers of the procedure and the accidents due thereto should be mentioned. I should say that the procedure, according to my method, is entirely safe. I have noted more than 1,000 cases of direct tracheo-bronchoscopy and have never as yet witnessed a disastrous result. Occasionally, especially when the examination is of lengthy duration, edematous swellings of the vocal cords have occurred, resulting in a slight hoarseness, or perhaps, especially in children, sub-glottic swellings appeared.

A long examination is always to be avoided because of the possibility of sub-glottic tumefaction. On this account, Fletcher Ingals proposes that an examination should not take longer than thirty minutes. Usually only a short period is needed. In long examinations besides the injury due to pressure of the instrument, an

overdose of the anesthetic may be given; therefore it is better to diagnose difficult cases in several sittings. I should advise that a direct examination be not of more than 10 minutes' duration.

Under all conditions one should always be prepared, during tracheoscopy, to perform a tracheotomy. Finder emphasized the need of proper assistance during this procedure and that in every case one should be prepared to have recourse to tracheotomy. Heindl noticed the sudden onset of suffocation after examining a struma-stenosis. The patient could only have been saved from asphyxiation by the rapid introduction of a cannula; tracheotomy instruments, however, were not at hand.

Pieniazek's observations in a case of posterior compression of the trachea are of interest. During tracheoscopy in a child with a retro-tracheal abscess causing stenosis of the trachea and bronchi, pressure on the upper portion of the abscess caused an extensive bulging of the lower part; this resulted in complete closure of the bronchi and consequent asphyxiation. Koerner also reports a case of death in a child on whom a tracheoscopy had been done because of a retro-pharyngeal abscess. He warns against the backward tilting of the head in such cases, since this may result in total occlusion of the trachea. I can verify this statement. In small children, suffocation may result even without posterior tracheal compression, merely because of a pronounced tilting of the head. In two children respiratory movement at once ceased when they were placed in the Rose position; as soon as the head was bent forward the breathing became normal. It is more advisable to examine children sitting or in a lateral position, as recommended by Johnston.

Injuries to the vocal cords may always be guarded against, but may occur in sensitive individuals even after pinselling the larynx. In one case a membranous laryngitis occurred after tracheoscopy, but it disappeared in a short time. Once, in our clinic, an inexperienced bronchoscopist clipped off a piece of the process vocalis of the right vocal cord while passing the glottis. Such accidents may certainly be avoided by the timely introduction of the tubal spatula during a slow turning movement. Only in isolated cases will it be necessary to use a mandrin to pass the glottis, as Massei and Gottstein recommend. It is useful only in unusual cases in which cocain has no anesthetizing effect. I have had two such cases.

Several fatalities after bronchoscopy are due to anesthetizing. Deaths due to chloroform and cocain are not entirely unavoidable

even in spite of the greatest care; nevertheless we should learn to use the anesthetic sparingly and to avoid the ill-effects of cocaine by using some of its less poisonous compounds.

There is a certain danger for the physician and patient as a result of the electric shocks, which occur while using not entirely non-isolated apparatus. Ingals thinks that this shock plus narcosis was responsible for the lethal termination in the case of two children. The use of more suitable apparatus will prevent such results. Emphysema due to bronchial injury was but once observed. In this case the inter-tracheal ligament had already been torn in a goiter-operation. Some weeks later, following a tracheotomy, emphysema developed, apparently due to the re-opening of the scar.

The indications for bronchoscopy are varied and numerous as is shown by the foregoing clinical observations. In the presence of foreign bodies in the bronchus its indications are ever positive; in affections of the bronchus and bronchial region, however, in spite of the few cases where even a therapeutic result was attainable, its indications are still merely relative. In such cases the advantages of bronchoscopy have not as yet been sufficiently established; therefore there are notable contra-indications. Patients who are difficult of auscultation or intensely sensitive may be considered such factors. Unfavorable complicating affections must not be present. In incompensatory conditions, in pronounced arterio-sclerosis, and in all conditions in which a rise in temperature must be avoided, this method should be abandoned. In severe dyspnea, too, it must not be attempted unless a therapeutic result is attainable.

The discussion of bronchoscopic disposal of foreign bodies and the worth of this technic is universally recognized. The significance of bronchoscopy for internal medicine and surgery is still, in many respects, unproved and must await further clinical data. But even at this stage we can affirm that it has been a valuable aid in internal diseases of the thorax, especially for diagnostic purposes. It is not claimed that this method should replace the others, the physical and Röntgen, nevertheless it should not be treated as a step-child; for, often, in obscure cases a proper diagnosis could be made by this method, even though the other methods proved inadequate. It is to be hoped that in a short time it may be said: the direct methods are as indispensable for internal medicine and surgery as indirect laryngoscopy.

ESOPHAGOSCOPY AND GASTROSCOPY.*

BY CHEVALIER JACKSON, PITTSBURG.

A complete review of all the literature with due credit to every worker would be practically impossible within the limits of time and space here allotted. It has seemed to the author better for the purpose of introducing the subject to formulate from the literature and from his personal experience, for your discussion, certain problems upon which opinions and practice vary. And while the opinions of the author are presented in a rather dogmatic way, they are intended to be merely postulates for your discussion.

It has seemed to the author that the greatest good from this gathering of the world's most skillful peroral endoscopists would come from a thorough discussion of a few of the most urgent problems that confront the man of average, or less than average skill, in his work. The author is in almost daily receipt of letters from the occasional esophagoscopist recounting difficulties in esophagoscopy, and occasionally deaths therefrom. And even in the hands of the most skillful, esophagoscopy has a degree of mortality which can and should be diminished.

One of the most important points that the author hopes will be fully discussed at this meeting is to determine under what circumstances general anesthesia is advisable for esophagoscopy. The principal factors to be considered, I believe, to be these:

Esophagoscopy upon the struggling, resistant patient whose pharyngo-esophageal musculature is in a state of spasm, is, especially in the hands of the less skillful, very dangerous to life. The ordinary risks of anesthesia are very much enhanced by risks of respiratory arrest, be this from reflex inhibition or mechanical obstruction of the trachea from the bulk of the tube or of the foreign body or of both, or from other causes. Spastic conditions of the hypopharyngeal and esophageal musculature, whether from the presence of a foreign body or other causes, are completely relaxed by general anesthesia. In children cocaine is dangerous. Other local analgesics are of questionable action in either children or adults, and moreover, a skillful esophagoscopy is not painful, so that it is relaxation and not analgesia or even anesthesia that is needed. A tightly impacted

*Read before the Meeting of the Third International Laryngo-Rhinological Congress, Berlin, August 30-September 2, 1911.

foreign body, especially if sharp or rough, can be removed more easily and with less trauma under the full relaxation of the pharyngo-esophageal musculature by deep general anesthesia. The trauma, if any, will be trivial, and thus external esophagotomy or the pushing down of the foreign body will never be advisable.

The author offers the foregoing assertions and the following postulates for your discussion:

1. Full and complete relaxation by general anesthesia is required for esophagoscopy procedures under the following classes of case: (a) For the extraction or morcellation of impacted foreign bodies, if large. (b) For the diagnosis of spastic conditions. (c) In uncontrollable children and adults only in the absence of the help of assistants trained to hold the patient properly, or in case of an esophagoscopist of lesser skill and experience.

In view of the fact that the less experienced are very apt to cause respiratory arrest in unskillful attempts at esophagoscopy; and also in view of the fact that respiratory arrest is less apt to occur and respiration is more readily restored in the etherized than in the chloroformed patient, the author offers this postulate for your consideration:

2. In the absence of clearly-defined contra-indications, ether is preferable to chloroform for esophagoscopy and gastroscopy.

The Rose position is so frequently mentioned in broncho-esophagoscopy literature that the author hopes that the discussion at this congress will forever condemn its use for endoscopy per os. Therefore, I ask your endorsement for this postulate.

3. The Rose position, though excellent for its original purposes, is utterly unfit for bronchoscopy, esophagoscopy and gastroscopy.

One of the greatest esophagoscopy problems of to-day is to determine the best methods of getting a start in the dilatation of strictures of exceedingly small lumen, say one or two millimeters in diameter. There have been many dilators devised, most of which can only be used in strictures of such large lumen that they do not need dilatation. Such instruments may be of use in cardiospasm, but cicatricial esophageal strictures of large lumen, or those in which a good start has been obtained, are of easy management, and the choice of methods is of little moment; nevertheless, the small almost impermeable strictures are extremely difficult to dilate in the first stages of the work. Personally the author has found nothing equal to these two means: (a) The double olive bougie, the olives about two cm. apart, the smallest size being about one and a half

millimeters in diameter, and this is the size of the distal olive throughout all the sizes, while the proximal olive increases a half millimeter in each size. (b) The string-cutting esophagotome. (c) Minute olive bougies threaded over swallowed dental floss silk. (Not useful in children too young to swallow a string). The author does not feel fully satisfied in all cases with his results, and he feels sure that esophagoscopists will all be interested in a full and free discussion of the question:

4. What are the best methods of obtaining a start in the dilatation?

The author hopes that the discussion which is to follow will shed further light upon the subject of the diagnosis of cardiospasm. In a case where there is difficulty in swallowing, possibly with regurgitation, yet where under general anesthesia, no obstructive lesion is found, and a large tube glides easily into the stomach, the inferential diagnosis of cardiospasm is probably justifiable; but it does not lessen the need for more uniformity among esophagoscopists as to the endoscopic picture, distinct from that of chronic esophagitis and diffuse dilatation. Therefore, the author offers for your discussion:

5. What are the most frequently observed esophagoscopic pictures of cardiospasm?

In regard to the indications for esophagoscopy, the author's opinions are as follows:

6. Any abnormal sensation referable to the esophagus noticed by the patient calls for immediate esophagoscopy. Only in this way can we hope to discover diverticula, esophagitis, lues, esophagismus, cardiospasm, superficial ulcer, and other curable lesions in time to cure.

7. The greatest of all contra-indications to esophagoscopy is lack, on the part of the esophagoscopist, of prolonged training under supervision of a competent master. The trained and skillful may examine any case of general or local disease with relatively little risk, while in the hands of the rough, the careless or the untrained, the esophagoscope is a dangerous and frequently fatal instrument. The dangers are in inverse ratio to the skill. While the author would not hesitate to advise esophagoscopy in a patient with aneurysm or very hard arteries, or in one with extensive esophageal varicosities, or in one with acute necrotic or corrosive esophagitis, if there were very urgent necessity for it; yet, esophagoscopy can only be indicated in such a case by very urgent conditions, such as the lodgment of a foreign body.

8. Early diverticulum of any type is amenable to cure by sub-diverticular esophageal dilatation, but in case of well-established diverticulum, the only service that can be rendered by the endoscopist is to furnish to the general surgeon an accurate description of the size, location and interior appearance of the diverticulum and its outlet, and to forestall recurrence by the endoscopic dilatation of this outlet.

The results of my three years of laborious efforts to collect statistics of mortality from the literature and by correspondence are very unsatisfactory. If the occasional esophagoscopist, the man with little practice, has a successful case, he publishes it. If he inflicts fatal traumatism he naturally has nothing to report but his own lack of skill, and he is not interested in accurate statistics. From the large clinics, of course, accurate statistics are published for the sake of scientific truth; but we must be guarded, I think, against conveying the idea that esophagoscopy is easy and safe, lest it lead to neglect of proper training under a competent master.

Of 616 esophagoscopies for foreign bodies there were nineteen deaths reported. Mortality, three per cent. Of 740 cases of esophagoscopy for disease, only eight (one per cent) died of causes attributable (so far as I could determine) to the esophagoscopy.

The percentage of mortality here shown probably indicates about the mortality of skillful work in the large clinics; but from the number of cases of acute traumatic esophagitis and septic mediastinitis and pleuritis, into which the author has been called in consultation, he feels that the mortality at the hands of the untrained must be many times greater than these statistics show. As evidence of this, the author received as confidential correspondence from laryngologists in need of help and advice, accounts of eight deaths from unskillful attempts at esophagoscopy by the untrained. These are not included in the foregoing statistics. These things seem to justify the statement that:

9. Esophagoscopy and gastroscopy (as well as bronchoscopy) differ from almost all other departments of medicine and surgery, in that they require a manual dexterity which is separate and apart from a knowledge of how to do them; hence, they should never be attempted without long previous training under the instruction of a competent master.

GASTROSCOPY.

Gastrosopes may be divided into open tubes, and those with optical apparatus. These may be again divided into rigid and flex-

ible instruments. It is too early in the development of the gastroscope to say which form of instrument will prove best, but one thing has been positively established by the author's work, namely, that the gastroscope, if it is to be used safely and is to be passed promptly in any and every case desired, must be passed by sight; and, therefore, must be free from lens systems when passed, though these may be used afterward if desired.

The author has never used an optical apparatus nor a flexible tube; so he feels that it is unjust for him to refer to them further than to say that he has never felt the need of the aid of flexibility, and he feels sure that no experienced esophagoscopist has ever any need of a flexible tube; or of a flexible tip, which latter would prevent the prime essential, passage by sight.

The objections to a lens system are that it requires distention of the stomach, which renders general anesthesia unsafe, and which pushes the walls to be examined far away from the tube, walls which otherwise are collapsed in front of the tube, where they may be palpated with a probe, wiped with swabs, and otherwise examined, a portion at a time, exactly as the proctologist examines the sigmoidal colon.

The efforts at gastroscopy have all been misdirected because the anatomic illustrations of the stomach are based upon the cadaveric stomach, usually shown inflated and in horizontal position; whereas, its position in the deeply anesthetized dorsally recumbent patient, examined with the open tube, is a collapsed elongated sac, dangling at the end of the tube; the pylorus being not less than ten centimeters inferior to the cardiac orifice in the average adult. (See drawings). The fundus and the lesser curvature, instead of being far away and around the corner, as the anatomic illustrations show, are collapsed against the tube-mouth.

The most easily explored areas of the gastric mucosa are the lesser curvature, which is vertical for two-thirds of its extent, the greater curvature throughout the left three-fourths of its extent, and the entire fundus, or cardiac end. The pyloric one-third is only brought into view by external manipulation. These observations are based upon 160 examinations with the open tube, the stomach being empty and collapsed, in which condition its long axis is nearly vertical.

The hiatus esophageus is not distensible, but it can be displaced laterally from three to eight centimeters, which gives from six to sixteen centimeters of movement. This is only possible under the

relaxation of deep general anesthesia. In the unanesthetized patient the diaphragmatic musculature pulls upon the central tendon in a way that fixes immobile the hiatus and the gastroscope just as the mast of a ship is stayed. It is the reluctance to use general anesthesia that has led to the erroneous conclusion that only a small area of the stomach can be explored without optical apparatus.

The extent to which the diaphragm can be dragged laterally, I had determined five years ago upon a radiograph taken by Dr. Russell H. Boggs from the living patient, with the gastroscope in position first in the extreme left position, then the extreme right position, two separate exposures of five seconds each immediately following each other on the same plate, the gastroscope being shifted from one side to the other between the exposures, the patient's position remaining unchanged. The degree of mobility was also demonstrated by Dr. J. Hartley Anderson, upon whose patient I did, four years ago, a gastroscopy in co-operation with him, while he was operating through the abdominal wound. From actual observation in the opened abdomen he stated that the movement of the distal end of the tube in the stomach, without his assistance, was twenty centimeters, and that he could place any portion of the stomach wall in front of the tube mouth. The degree of mobility has been demonstrated upon the fully anesthetized living patient, by the author in another way. In a darkened room the distal light can be seen through the abdominal wall of a lean patient. This light has been seen by my colleagues at the Eye and Ear Hospital to move from within about four centimeters of the right abdominal wall to within about six centimeters of the left abdominal wall and vice versa.

There is no human being with a normal spine and a normal esophagus into whose stomach a straight and rigid gastroscope cannot be readily and safely introduced, provided: (1) The patient is fully anesthetized. (2) An open tube of light construction is gently passed by sight. (3) The patient's head is held in the Boyce position. (4) The operator is a skillful esophagoscopist.

Statements to the contrary are the result either of inexperience or of experience with gastroscopes that cannot be passed by sight. Flexible guides are unnecessary, rarely of aid, and are dangerous. The inexperienced will have trouble at the cricoid, the introitus esophageus, but surely no esophagoscopist will. It required only thirty-eight seconds, in my clinic, for Professor Killian, in his careful, gentle, skillful way, to pass the gastroscope from the mouth to

the greater curvature of the stomach. I cannot understand why so many authors have stated that they had difficulty in passing a rigid instrument through the cardia.

Gastroscopy per os with the open tube is often limited to the left two-thirds of the stomach, unless there is a mass attached to the pylorus, in which case the pylorus can be moved over to the distal end of the gastroscope by external manipulations by an assistant. In many cases the pylorus can be moved over in patients where there is no mass, and there is every indication that practice will lead to development of this to the point where the pylorus can be examined in every case. The manipulation should always be strongly downward as well as to the left.

The safest anesthetic I believe to be ether, though chloroform may be added for relaxation as needed, after the patient has had the stimulant effect of the ether. While for esophagoscopy little or no anesthesia is needed, gastroscopy requires the full and complete relaxation of deep anesthesia, with abolition of all but the deep reflexes.

Dynamo circuits are dangerous for esophagoscopic and gastroscopic use, because of the risk of "grounding," and because of the large area of moist contact in such close proximity to both vagi, and to certain nerve distributions in the esophageal wall the exact nature of which has never, to the author's knowledge, been determined. The danger referred to is present, regardless of whether the illumination is proximal or distal.

Distal illumination is advantageous for gastroscopy because of the length of the tube necessary. It gives a better illumination, enabling the tissues to throw back a strong image; and it is an oblique illumination, which as every ophthalmologist knows, reveals details otherwise invisible. The statement has often been made in literature that the distal light "steams," or causes vapors, to rise because of its heat. It does not get hot, and in over five thousand (estimated) examinations of the air and food passages, I have never seen a distal lamp of any kind "steam," nor has such a thing been observed by any of the many men who use various forms of cold lamps. (Ingals, Coolidge, Mosher, Casselberry, Coakley, Johnston, Murphy, Thomas, Einhorn, McCoy, Barnhill, Hill, Balenger, Boyce, Winslow, Arrowsmith, Kyle, Hudson-Makuen, Richardson, McKinnie, Halstead, Bowen, Theisen, White, Stucky, and about a hundred other experienced esophagoscopists.) As to its becoming soiled, it is usually necessary once or twice in an

hour's work to withdraw the light-carrier, point it at the nurse, who cleanses it. This procedure and the replacement of the light-carrier ready for work, require usually from ten to twenty seconds. There is no mirror or prism to be cleaned. All instrumentation, swabbing, probing, hooking, specimen-taking, forceps-using, etc., can be done under guidance of the eye, as in the nose or in the ear.

One of the important spheres of usefulness of the gastroscope is to aid the abdominal surgeon by reporting to him the interior appearance of any suspected area that he may, at operation, place before the mouth of the open tube. The tube he can readily feel through the stomach wall, with his hand in the abdominal cavity. In working thus the gastroscopist has his own assistants, sterile nurse, and complete organization entirely separate from that of the surgeon. Anything but an open tube is useless for this.

The author has viewed the stomach endoscopically in 160 cases and in only one of these has death occurred from any cause whatever within thirty days. This one case was moribund from hemorrhage when admitted. The bleeding point was identified gastroscopically, when placed in front of the gastroscope by the hand of the abdominal surgeon (Dr. J. Hartley Anderson), who at once excised it.

Gastroscopy will never come into regular use until it is pursued only by endoscopists, who shall report to the gastro-enterologist, as the Roentgenologist reports. In conditions other than malignancy, the gastro-enterologist or the surgeon will then take the report along with the laboratory report, the anamnesis, etc., and will cure the patient.

In the author's opinion, gastroscopy is indicated in any case of suspected stomach disease in which the diagnostic question justifies general anesthesia. It is only contra-indicated in cases in which organic disease, other than gastric, renders deep anesthesia of more than usual risk.

Wherever in medicine and surgery physical examination has supplemented inferential symptomalogic diagnosis, many supposed truths and fundamental laws have been proved fallacious. It is reasonable to suppose that the routine use of visual examination of the stomach will accomplish the same result.

Westinghouse Building.

CONSIDERATION OF THE MECHANISM OF PRESSURE IN THE PRODUCTION OF VERTIGO WITH REPORT OF CASES.

BY CLARENCE JOHN BLAKE, M. D., BOSTON.

In previous papers on this subject¹ the attempt was made to present, from observed cases, an inference as to the influence of combinations of pressure, extrinsic and intrinsic, in the production of vertiginous symptoms, with especial reference to the study of those cases in which the extrinsic cause might be regarded as predominant.

The hypothetical basis for these observations was that, while moderate degrees of variation, from the constant of the ampullary end-apparatus, could be compensated for by the provisions for movement in the normal sound-transmitting apparatus, and in the aqueducts, greater degrees of variation, either beyond the possibility of normal compensation, or inhibition of the normal compensation itself, would be productive of symptomatic results unless the inhibition had been one of such slow increase as to permit of gradual accommodation to the abnormal condition, evidenced, for instance, in cases of progressive stapes fixation, or of progressive contraction of the tensor tympani muscle.

In the study of a symptom of such varied causation, it is only by compilation of observations from different sources that reliable differentiative data can be obtained, and this is especially true of the more vague, the less acutely pronounced manifestations, those in which the prime causative factor is determinable only by an elaborate process of successive eliminations.

With a well-marked intra-labyrinthine hemorrhage, or effusion, the diagnosis, both as to the character and the location of the lesion, is usually easily determinable, and this is equally true in cases with pronounced evidence of intra-labyrinthine pressure of extrinsic origin.

In the former instances, when once the acute stage has passed, and the effect of the localized intra-labyrinthine pressure has been compensated for by natural processes of repair, the vertiginous symptoms recur only under conditions of like causation, a repetition of the hemorrhage or effusion, for instance, or, more fre-

quently, recurrently, under the temporarily increased intra-labyrinthine pressure incident to such a cause as a localized suspense of vaso-motor inhibition. In the latter instances the symptoms of ampullary disturbance may persist with only such variations as are incident to intra-labyrinthine circulatory changes, until the major, accessible, extrinsic pressure-cause is removed, be it a new growth or an epidermal accumulation in a suppurative middle-ear, an extensible cicatrix of the drum-head transmitting preponderating atmospheric pressure to the stapes or a muscular retraction to be overcome by the creation and protracted maintenance of a partial vacuum in the external auditory canal.

In cases of recurrent vertiginous attack with inadequate evidence of an intra-labyrinthine or of an accessible extrinsic pressure-factor, it seemed desirable to test the effect, upon the line instituted by Babinski, of decrease of intra-cranial and, correspondingly, of intra-labyrinthine pressure by some means which would leave the auditory apparatus intact, an additional incentive to such a series of investigations being previous experiences in disturbances of intra-labyrinthine pressure, incident to investigations in regard to the removal of the stapes.²

Under these considerations, in conjunction with Dr. J. J. Putnam, in a series of adult cases in which the extrinsic pressure-factor was at a minimum, or absent, lumbar puncture was practiced with results thus far sufficiently favorable to warrant a continuation of the investigation. In no instance were there more unfavorable consequences than severe headache of several days' duration in three instances; in all of the cases treated there has been a temporary amelioration of the condition, and, in the majority, entire relief from the vertiginous attack during a period of from a few months to three years, the latter being the major limit of observation.

In two cases in which the attacks recurred within a year the onsets were less severe and the complex incomplete, and a repetition of the lumbar-puncture was followed by entire relief up to the date of the last observation.

In all instances the withdrawal of fluid ranged from ten to fifteen ccm., and the cases were kept under immediate observation for several days.

Case 1. A typical case is that of a student, a young man 24 years of age, who had, during one and one-half years previous to his coming under observation, attacks of vertigo, preceded by intense circulatory tinnitus and followed by nausea. These attacks occurred

at irregular intervals, varied in degree of severity and seriously interfered with the prosecution of his law studies. Aural examination showed both middle-ears to be normal in appearance, the hearing in the left ear normal and in the right ear much impaired for tones of medium high pitch and wanting, both aurally and by bone-conduction, for tones of medium low pitch. Careful examination revealed no central cause or disturbance, and lumbar puncture was practiced with withdrawal of fifteen ccm., since which time, three years ago, there has been no repetition of the vertiginous symptoms and only such occasional slight dizziness as could be accounted for by increased cerebral circulation incident to protracted study and fatigue.

Immediately after the lumbar puncture the hearing in the right ear was found to have improved for tones of medium high pitch, having doubled for the Politzer acoumeter, for instance. This improvement in hearing increased up to one year after the date of the lumbar puncture and has since then slowly decreased, without, however, reaching its first level; the hearing for tones of medium low pitch remaining unchanged.

Case 2. That of a man 54 years of age, with a history of a first occurrence of Ménière's complex of symptoms in the right ear two years previously, and frequent recurrences at variable periods. There was a moderate degree of thickening of both drum-heads, with slight stretching in the posterior superior segment on auto-inflation. The hearing in the left ear was practically normal, and in the right ear was decreased to fifty per cent for tones of medium low pitch, and to five per cent of normal for tones of medium high pitch. In the interval of one week, between his first and second visits, he had four attacks of vertigo, with nausea occurring early in the morning, but with emesis after one attack only; two days later lumbar puncture was done, with the withdrawal of between ten and fifteen ccm. of fluid.

The lumbar puncture was followed by headaches for three days and since that time, a period of eighteen months, there has been no attack of vertigo; the hearing in the right ear for tones of low pitch has increased to eighty-five per cent of normal and for tones of high pitch has remained virtually unchanged. The improvement after the operation for lumbar puncture lasted about two months.

Case 3. In still another case, one of a third series of ten cases, a man of 29 years of age, there was the history of a first attack of vertigo six years ago, without nausea or concomitant complex symptoms; the second attack was one year later and more severe, in so

far as the vertigo was concerned, but also unaccompanied by nausea; the third attack followed four months later and since that time the attacks have been variable, both in frequency and in character; they occur oftener and occasionally at night.

The attacks are preceded usually by an increase in the circulatory tinnitus; nausea and vomiting occur only infrequently, and the patient sometimes resorts to artificial emesis for the purpose of shortening the attacks. Consciousness is never lost in the attacks occurring in the daytime, even when the vertigo is most severe, but they are apt to be followed by moderate somnolence and free perspiration.

Both drum-heads had a moderate general and slight interstitial thickening, the tympano-pharyngeal tubes were free, the hearing was normal in both ears for tones of moderate high pitch, but decreased to twenty per cent of normal for tones of medium low pitch.

Lumbar puncture was followed by severe headache lasting for ten days and gradually decreasing. During the year and one month following the operation there was but one slight attack of vertigo, transient and without nausea. Then several severe attacks occurred and the operation was repeated with entirely satisfactory results. (See Dr. Putnam's paper, Case 1.)

The purpose of this short communication, which is to be followed later by a tabulation of cases, and the addition of observations on caloric nystagmus when a larger number has been observed; is to request comparative observations from others along this line of research, for the lumbar puncture has proved of sufficient benefit in a number of cases to make its use, tentatively even, preferable to immediate resort to incudectomy, to stapedectomy or to operation upon the vestibule.

Case 4. Woman, married, 41 years of age. First attack of vertigo followed confinement, five years previous to her application for relief. This vertigo was accompanied by nausea, without vomiting. The hearing in both ears was impaired, being, for all tones, fifty per cent of normal in the right ear and ten per cent of normal in the left ear; both drumheads were moderately thickened and retracted, and a moderate improvement in hearing following inflation of the middle ears.

In February, 1906, lumbar puncture was done. There was no improvement for the first few days, but after that she felt much better and the operation was repeated shortly afterwards. A letter received one year later reported that she had been much better since the last operation. After this she again became worse and in July,

1908, the operation was repeated, but without giving relief. She was at that time pregnant and had a miscarriage and was in bed for several weeks. The dizziness was then very severe, and her family physician did a lumbar puncture for the third time, without result.

The hearing in this case decreased gradually, in consequence of thickening of the tympanic mucosa. Under subsequent observation there were slight attacks of dizziness with occasional more severe attacks accompanied by nausea. On the whole, this is a case where the improvement was fairly marked in the beginning, but the change in the ear was a serious one, and the gain has not been persistent.

Case 5. A man, 41 years of age. One year previous to his first visit he had Ménière's complex of symptoms, followed by circulatory tinnitus in the right ear. Urine examination showed the presence of sugar, which disappeared six weeks later under general treatment, but the circulatory tinnitus in the right ear and the tendency to vertigo continued. The hearing for tones of high pitch was normal in the right ear, but for tones of medium low pitch was entirely wanting; the hearing in the left ear was practically normal. Under general hygiene and the administration of pilocarpin, the hearing for tones of medium low pitch in the right ear increased to forty per cent of normal, decreasing subsequently under conditions of nervous over-tire.

November 23, 1909, the patient reported that he had been without vertigo for two years and had gradually decreased the bromide of potassium previously ordered; there was now an increase of deep-toned circulatory tinnitus in the left ear, accompanying a decrease in hearing for tones of medium low pitch.

In March, 1910, the patient again reported a further increase of circulatory tinnitus accompanying a sense of fullness in the left ear, in which there was noted an appreciable further decrease in hearing for tones of low pitch.

February 27, 1911, the hearing in the right ear had seriously decreased for all tones; there was slight and continuous vertigo, and the patient was referred to Dr. Putnam for examination with the possibility of recourse to lumbar puncture. Lumbar puncture was done on February 28, 1911, and fifteen ccm. of fluid were withdrawn. The patient had no subsequent headache and he felt much relieved. The latest report (March 19, 1911) said that he was "wonderfully well the first few days, then the hearing fell off, but had improved. He had no vertigo, and the tinnitus had been less."

(In this case the lumbar puncture was done less on account of dizziness than for relief from the tinnitus and with a view to possible improvement of the hearing.)

Case 6. Woman, married, 50 years of age, with the history of a sudden attack of vertigo two years ago and occasional attacks since, especially in conjunction with the circulatory disturbances of the menopause. An examination by Dr. Pfaff showed no gastric trouble as an exciting cause.

During the succeeding two months there were repeated attacks of vertigo and the patient was referred to Dr. Putnam for lumbar puncture, which was done May 10, 1909. This operation was followed by severe headache. On May 20 there was an increase of the circulatory tinnitus, with vertigo and nausea, but no vomiting, but by May 29 this had been relieved. There was but slight nausea, variable circulatory tinnitus, and a marked improvement in the general condition.

On June 9 the patient reported, by letter, that she was in better general condition than she had been for months previously; there had been no vertigo, only slight dizziness, and a marked decrease in the circulatory tinnitus. In another letter on June 17, the patient reported an attack of vertigo, followed by nausea, lasting over ten hours, but no vomiting.

June 25, there was another attack of vertigo, with nausea, culminating in vomiting, the first emesis since the lumbar puncture.

On November 17 of the same year, the patient reported her general condition very much improved and that there had been no vertigo since the last report.

July 1, 1910, the patient reported the general condition as still further improved; the hearing in the right ear, which had been moderately decreased for tones of high pitch, had improved; there was no dizziness and only occasional circulatory tinnitus.

Case 7. Woman, unmarried, 44 years of age. She was seen November 8, 1908, on account of impairment of hearing, more marked in the right ear, as a consequence of chronic, progressive middle-ear catarrh. The hearing in the left ear was normal for tones of high pitch, seventy-five per cent of normal for tones of medium low pitch, and in the right ear twenty-four inches for the Politzer acoumeter and seventy-seven per cent of normal for tones of low pitch.

Under middle-ear treatment the hearing moderately improved and the patient was not seen again until January, 1909, when the

hearing in the right ear for the Politzer acoumeter was six inches and there was no hearing for tones of medium low pitch, as tested aerially by a tuning fork of 512 vibrations. The patient reported that six months previously she had had an attack of vertigo with vomiting and nausea, followed by diarrhea, and since then similar attacks with great frequency and of equal severity. Bromide of potassium had been given without appreciable effect.

On July 30 she was referred to Dr. J. J. Putnam with the opinion that there had been an invasion into the right labyrinth at the time of the first reported vertigo. Between July 30 and September 25 there were two lumbar punctures and but three slight attacks of vertigo, and the hearing for the Politzer acoumeter had doubled, but there had been no gain in the aerial hearing for tones of medium low pitch.

A letter received from this patient, dated January 3, 1911, says that she is very much better as regards her dizziness; "It does not trouble me in the winter season, but last summer I was dizzy, and it seemed to come on more quickly and went off quicker, also."

Case 8. Man, 33 years of age, reported October 24, 1908, with the history of gradual decrease of hearing in the right ear, with circulatory tinnitus. Eighteen days previously he had a sudden attack of vertigo with the sensation of falling backward, nausea and emesis. One week later he had another sudden attack of vertigo with the sensation of movement forward, followed by nausea but no vomiting, and a third attack, three days previous to his visit, with the sensation of movement forward, no nausea and no vomiting; since this last attack there has been constant dizziness and a staggering gait, with slight general headache. There was a moderate general thickening of both drumheads, the hearing in both ears was normal for tones of high pitch, thirty per cent of normal in the right ear and seventy-five per cent of normal in the left ear for tones of medium high pitch. There was, in this case, an obscure history and the patient was referred to Dr. J. J. Putnam.

Further examination showed that this patient had an incipient tabes. Lumbar puncture was done for the first time on October 31, 1908. One week later the patient reported that he had been better; there had been a little dizziness every day, especially in the morning.

On August 27 he reported slight dizziness every day for the past week. On that day repetition of lumbar puncture and withdrawal of eighteen ccm. of fluid with improvement. Occasional communications and examinations at intervals up to March, 1911. Im-

provement in regard to the dizziness has been maintained; no great change in the tabetic symptoms.

Case 9. Woman, unmarried, 35 years of age. She was seen in June, 1891, on account of moderate decrease in hearing incident to chronic progressive middle-ear thickening, the hearing being improved under simple middle-ear treatment.

This patient was again referred, March 18, 1909, by her family physician, on account of attacks of vertigo for which there seemed to be no aural cause as there had been no further change in the middle-ear and no further decrease of hearing. She was, therefore, referred to Dr. J. J. Putnam for general examination, and lumbar puncture was done on March 26, with withdrawal of eighteen ccm. of fluid. Her condition remained variable, but the general health was very poor owing largely to external conditions and to her work. The lumbar puncture was repeated in April and again in August, after an especially severe attack. Since then the patient has been on the whole a great deal better. She has been seen at intervals up to the present date, March 19, 1911. A letter received from her six weeks after the last operation, says: "I have not had a vertigo since August 22 (date of the last puncture). I noticed a decided change for the better about September 22 and the tinnitus almost ceased, although it has its ups and downs and I am still feeling very tired." Since then there has been scarcely any severe vertigo, although the patient is under a considerable nervous strain, the effects of which are strongly felt upon her general health.

A letter of February 2, 1911, about a year and a half after the last lumbar puncture, says: "Since then I have only had two pronounced vertigo attacks, one the next morning after the operation, and the other about ten days ago. Lately I have had considerable (slight) dizziness which I notice when I am walking on the street."

In this case the hearing, which had been moderately defective for tones of medium low pitch, was found to be improved after the lumbar puncture.

Case 10. Man, 43 years of age. In September, 1903, he had supra-orbital headache and his first attack of vertigo, with similar attacks accompanied by a sensation of motion to the left side, and intercurrent circulatory tinnitus in the left ear lasting for more than a year, the head-symptoms and the vertigo ceasing during the succeeding year under general hygienic treatment.

In the early part of 1906, on looking suddenly upward toward a bright light, he had a sudden attack of vertigo with sensation of

movement to the left. An examination of the eyes by Dr. Coggin, of Salem, showed a moderate degree of astigmatism, relievable by glasses, which he has since worn. Recent sudden attacks of vertigo with a tendency to fall toward the left, and a progressive loss in weight led him to seek special advice. Both drum-heads showed very slight thickening of the tympanic mucosa and a marked stretching of the posterior superior segment of the left drum-head. An application of collodion decreased the relaxation of this portion of the drum-head and coincidently relieved the vertigo, without, however, affecting any improvement in hearing for tones of medium low pitch, which had been decreased to twenty per cent of normal.

On February 12, 1907, he reported himself as having been free from vertigo with the exception of one attack of vertiginous dizziness and one of marked vertigo in the interval since his previous visit in December, 1906. On April 3, he reported three comparatively severe attacks of dizziness, but his general condition had improved and he was gaining in weight.

On July 5, 1907, he reported a sense of fullness in the head, with slight dizziness and on the morning of the same day, on awakening, a distinct attack of vertigo. The hearing in the left ear was found to have decreased markedly for all tones, having fallen from nearly normal, in the left ear, for tones of high pitch, to twelve inches for the Politzer acoumeter, and for tones of medium low pitch to less than ten per cent of normal, and a lumbar puncture was done.

To the present date, March 19, 1911, there has been no severe vertigo. The patient was encouraged to make light of his slight dizziness and to continue his work as usual. The plan has worked very well and he has gained in general health as well as in reference to his special symptoms. On the other hand, he has reported occasional slight sudden attacks in which there has been no marked vertigo, but sometimes, possibly, a momentary loss of consciousness. No further signs pointing to epilepsy have appeared and it seems most probable that these slight seizures are connected with the aural vertigo. On the whole, the condition of the patient has been very much better since the lumbar puncture.

226 Marboro Street.

THE VALUE OF LUMBAR PUNCTURE IN THE TREATMENT OF AURAL VERTIGO.

BY JAMES J. PUTNAM, M. D., BOSTON.

It is now nine years since Dr. J. Babinski, of Paris, first called attention to the therapeutic value of the withdrawal of ten to twenty ccm. of cerebro-spinal fluid as a means of treatment of certain forms of aural vertigo, his interest in the matter having become aroused in the course of his studies on the vertigo and nystagmus attending the action of the galvanic current upon the structures of the labyrinth.

Babinski's first communication on this subject was before the Société médicale des hôpitaux, on October 31, 1902, and since then he and others have published numerous papers relating directly or indirectly to the same topic. A full list of these articles is given in the graduation thesis of Edouard Molard,¹ which sums up all the available information and adds a number of new cases. The whole number of cases thus far reported, by Babinski and others, runs up to several hundred.

My own attention was first attracted to the matter five years ago, since when I have used this treatment in cases referred to me by Dr. C. J. Blake and several others of my own, with results which on the whole have been distinctly favorable.

We have thought it worth while to report these results because the use of this treatment, in spite of having been once or twice commented on in American publications² has by no means received the attention that is its due.

The considerations most worthy of attention³ are the following:

1. It is to the disorders of the semi-circular canals that aural vertigo is due, and it is by acting on this portion of the labyrinth that the galvanic current produces (in normal subjects) vertigo, nystagmus and the inclination of the head towards the side of the positive pole.
2. The functional efficiency of the apparatus of which these canals are an essential part may be impaired even though the cochlea and auditory apparatus are in a normal state, so that tests for hearing are an insufficient guide in the determination of the labyrinthine condition in cases of aural vertigo. Much better guides

are (a) the strength of galvanic current required for producing vertigo, nystagmus and inclination of the head, and determination of the direction of this inclination; and, (b) equilibration tests, such as those of Bárány.⁴

The best cases for treatment by lumbar puncture are those where these various tests show that the labyrinthine apparatus is still in a fairly normal state. Where the neural degeneration is far advanced, the effects of withdrawal of cerebro-spinal fluid are less marked at the outset and repetitions of the operation, which in the better cases work well, produce less and less marked results and are eventually of no benefit.

The most favorable cases of all are those of pure labyrinthine origin and of relatively short duration. In such cases no great disturbance of hearing is present and especially no serious middle-ear disease. It is also noteworthy that in cases of this class the sensitiveness of the labyrinthine apparatus to the galvanic current, which before the treatment by lumbar puncture may have been poor, as shown by the fact that it required a strong current (even twenty ma. or more) to cause the vertigo, inclination and nystagmus, even if it could be induced at all, after the puncture may become again more nearly like the normal. This change indicates a physiological improvement which may not be indicated by any corresponding change in the patient's feelings, i. e., by any great modification of the vertiginous tendency.

The prognosis as regards results of treatment varies so much with the character of the cases that percentages become misleading. It may, however, be fairly said that the outlook is very good indeed for those cases where galvanic and other tests indicate a labyrinthine vertigo with but little nerve degeneration, so much so that few patients fail to obtain benefit, although occasionally two or even three treatments, at intervals of two to three weeks, may be required for the best results.

The amount of fluid withdrawn in Babinski's first experiments was five to ten ccm.; later, the withdrawal of fifteen to twenty ccm. was found to give better results. The relief from the vertigo sometimes occurred at once, sometimes only after the lapse of several days. In these latter cases, Babinski thinks the fluid must have been re-secreted by the time of the setting in of the improvement. In a fair proportion of the cases any tinnitus which had accompanied the vertigo, and even, though less often, the deafness, if this was present, were likewise more or less relieved. No unto-

ward results were observed greater than headache, with or without nausea, of one to several days, or even one or two weeks' duration.

Five years ago I called Dr. C. J. Blake's attention to these interesting statements and did a lumbar puncture on a patient whom he kindly referred to me. Since then I have used the same treatment in about twelve of his cases and several of my own with results that have been equally satisfactory with those of Babinski. Among the most strikingly favorable cases I would refer especially to those of two relatively young male adults, 24 and 29 years old, respectively, both cultivated and thus good observers of themselves. (See cases 1 and 3 of Dr. Blake's paper.) It is noteworthy that in both of these cases the headache and nausea consequent on the lumbar puncture were more severe and protracted than in any of the other instances. These symptoms kept the patients practically confined to bed for about two weeks, and I should have felt alarmed for the result had not the temperature in both instances remained normal. It would naturally be thought that these two coincident results, headache and relief, implied the withdrawal of an unusual amount of fluid. But this is not the fact and this inference is not justified, as the following narrative will show.

Case 1. One of these patients, a dentist, 29 years old, had suffered intensely from vertigo of five years' duration, considered by Dr. Blake as dependent, at least in part, on labyrinthine disease. The dizziness came partly in severe attacks attended with sweating, nausea and vomiting, partly in continuous periods of long duration. With the disappearance of the post-operative headache he found himself practically well, and whereas he had been almost unable to work he worked regularly at his office for the whole ensuing year. Then the attacks returned, as of course must sometime happen, since we are dealing therapeutically with a secondary not a primary pathological condition, and, therefore, the same operation was repeated, the same amount of fluid as before, fifteen ccm., being withdrawn. But this time, to my surprise, absolutely no headache followed and the next day he returned to his home again practically well, and has remained so to the present time, about one month.

The headache, then, seems not to be a measure either of the good accomplished or of the amount of fluid that has been taken. Can it be taken as a measure of the length of time required for the re-secretion of the fluid and the re-establishment of the intra-cranial pressure? I have no special data for answering this question. It

is, as Babinski says, to be regarded as certain that the re-secretion takes place very rapidly. If this is so, then either the symptom (headache), when it occurs in a severe form, continuing one to two weeks, must overlast the re-secretion, or else the dictum of the physiologist does not always hold good. I can, however, well believe that the former alternative is the correct one and that the headache last longer than the re-secretion, just as the relief following the operation lasts, in favorable cases, obviously much longer than this process. It may be that, in both cases, changes in circulation have been set up which are more persistent than the cause which set them up, or we may be obliged to fall back on the somewhat vague notion which we speak of as the "breaking up of habits in the nervous system," looking upon the relief of the dizziness as analogous to the relief of epilepsy which occasionally follows operations of indifferent sorts or accompanies attacks of fever. Of course, to use such vague terms as the breaking up of a habit is really to admit that we still lack a sharper explanation.

Case 2. The second of the two cases to which I have referred is that of equal interest with the last, especially for the reason that the relief has been of long duration. The lumbar puncture was done in February, 1907, and a letter received this very morning, that is, four years later, says: "I have had absolutely no dizziness since that operation. You may remember that prior to that I was greatly inconvenienced by frequent and severe attacks of dizziness. I used to be always considered pale, but very soon after the puncture my friends began to remark that I had more color. I have heard no comments about my lack of color, except occasionally when I have not been feeling well. My health seems to be very good. I consider the puncture to have been a great success." Dr. Blake's paper contributes further details for both these cases and reports the principal facts relating to the rest.

In closing, I desire to speak briefly of two patients of my own whose cases are of great interest, each for a special reason. The first case is that of a lady, 81 years old, suffering from well-marked arterial degeneration, and whom I saw about a month ago in consultation with Dr. Donley, of Providence. She had suffered from severe dizziness for a long period and had had more or less ear trouble with fairly definite attacks of vertigo, dating back to about four years before. At the time of my visit she was suffering so much that for a number of days it had been impossible for her to walk alone and almost impossible to do so even with assistance.

It was obvious that she had arteriosclerosis, and I should have hesitated much about the propriety of doing a lumbar puncture on so old a person had it not been for my experience in another case and for the fact that I knew that this slight operation had been done on arteriosclerotic people without apparent harm. I, therefore, did a lumbar puncture on the spot, withdrawing ten ccm. of fluid. The result was a partial relief and an encouragement to a repetition of the proceeding by Dr. Donley himself, two weeks later. The report of the effects of this have been very gratifying thus far.

Case 3. The other case is that of a gentleman, a medical colleague, of advanced age and with an intense atheroma of the arteries of long duration, as a result of which he had repeated slight attacks of cerebral palsy of one or another sort. For some weeks before the time of which I speak, he had been suffering from intense headache, which no ordinary measures could satisfactorily relieve. I saw him only in consultation, but advised a lumbar puncture of about fifteen ccm. of fluid, and this was done by his physician with a result that the pain disappeared and remained absent during the several months preceding his death. The lumbar puncture was followed by absolutely no unpleasant consequences.

Encouraged by the therapeutic results given in this paper, I have now begun to make systematic galvanic tests of the vertigo, head-inclination, and nystagmus, but as yet I can only confirm the statement made by previous observers, that in the severe labyrinthine cases a current of twenty ma. may be without effect.

At a meeting of the Gesellschaft der Aerzte in Vienna, April 8, 1910, Bárány⁵ reported an interesting case characterized by a high degree of deafness, of left-sided tinnitus, and attacks of dizziness. These attacks of dizziness were of two sorts: Those of the first sort came with every turn and inclination of the head toward the left and were of very brief duration; the others came now and then, apparently spontaneously. These latter were much more severe and were accompanied by nausea and vomiting. Every attack of vertigo was accompanied by an increase of the tinnitus.

The patient was carefully examined and in the end the vertigo was relieved by lumbar puncture, while the tinnitus remained unchanged. X-ray investigations indicated that the intra-cranial pressure was increased and other tests seemed to show that the tinnitus was of central origin rather than a direct result of labyrinthine disease, which, however, was undoubtedly present.

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2. A translation of one of Babinski's earlier papers, giving the most important facts, was published in the *Annals of Otology, Rhinology and Laryngology*, 1904, vol. xiii, p. 129. See, also, Hand: Critical summary of the literature on the diagnostic and therapeutic value of lumbar puncture. *Am. Jour. Med. Sc.*, Philadelphia, 1900; Hawkins: Aural nystagmus and vertigo. *Prov. Med. Jour.*, March, 1908; and especially, Oppenheimer: Lumbar puncture in otology. *New York Med. Jour.*, 1908, lxxxviii, 1176-1179.

3. Cf. the thesis of Molard, above cited.

4. *Monatschr. fuer Ohrenheilk.*, Berlin, 1906, et al. Normal individuals may react to $\frac{1}{2}$ or 1 ma.

106 Marlboro Street.

Disease of the Auditory Nerve in Acquired Syphilis. O. MAYER.
Wr. klin. Wchnschr., March 16, 1911.

From a study of sixty-five cases of affections of the auditory nerve in syphilitics, Mayer arrives at the following conclusions: The auditory disturbances may appear as early as three weeks after the primary lesion, though the usual interval is during the first six months. However, in some cases, twenty-five or thirty years have intervened. The early symptoms of syphilitic ear-affection are subjective noises in the ears and dizziness. In the later stages of secondary syphilis, aural symptoms are concomitant with and may be considered as a part of a recurrence. The auditory disturbance comes on gradually, is usually bilateral, or the deafness is greater on one side than on the other. In half the cases, vestibular symptoms were observed, but no isolated vestibular nerve-affection. Some cases of vestibular affection, the author feels, are due to the injection of salvarsan.

Ed.

A METHOD OF OBLITERATING THE NASO-FRONTAL DUCT, AND CATHETERIZING THE FRONTAL SINUS.

BY HARRIS PEYTON MOSHER, M. D. BOSTON.

The anterior end of the middle turbinate bridges across the upper third of the unciform groove and gains an attachment to the outer side of the nasal cavity on the inner surface of the ascending process of the superior maxilla. The naso-frontal duct, the drainage canal of the frontal sinus, in twenty-five per cent of cases is continuous with the upper part of the unciform groove. More often, or in fifty per cent of the cases, it opens under cover of the anterior end of the middle turbinate in line with the unciform groove and a little above it. In such instances the groove ends blindly or in an anterior ethmoidal cell. In a large proportion of subjects there is a distinct swelling on the inner upper surface of the ascending process of the superior maxilla. The mound made by this swelling is just in front of the anterior end of the middle turbinate and often merges with it. This mound is caused by a cell of the anterior group which has been named from its position the agger nasi cell.

While studying the relations of this cell I found that if its inner wall was broken down with a curette the head of the curette at once entered a sizable cavity. Experiment showed further that if the instrument was carried outward at this level it had a play of a quarter to half of an inch before it reached the wall of the orbit. In this cavity anteriorly the curette brought up against the hard posterior edge of the ascending process of the superior maxilla, while posteriorly it opened up the ethmoidal bulla. All this was of interest but the important observation was made last. A probe bent in the usual manner for catheterizing the frontal sinus was introduced into the cavity opened up by the curette and it was found that it entered the frontal sinus with great ease.

In order to test the worth of this finding, fifty-five half-heads were taken and in those which showed the swelling caused by the agger nasi cell, and such specimens were in the majority, the curette was entered at this point; in the other specimens the curette was made to pierce the anterior end of the attachment of the middle turbinate and carried outward until the resistance of the lacrimal bone was felt. The instrument meets with very little resistance from the partitions between the cells; and so it was carried backward and downward a quarter to half an inch. This turned the

anterior portion of the ethmoidal labyrinth through which the naso-frontal duct runs into one large cavity. In the roof of this lay the opening of the duct. In the fifty-five half-heads a probe passed into the cavity thus formed readily entered the frontal sinus through its duct in all but three or four instances. In the cases in which the probe did not enter the frontal sinus it entered an ethmoidal cell in front of the duct and projecting into the sinus, the type of cell which is called a frontal bulla. In the few cases where this happened, by withdrawing the probe and trying a little further back the naso-frontal duct was easily found.

As far as experimental work on the cadaver goes, this method which has just been outlined is the surest one known to the writer of catheterizing the frontal sinus. I have tried it but twice on the living. In both of the cases it succeeded and in one of them stopped me from doing the modified Killian operation, much to the delight of the patient. At a later time when I have done still more work on the cadaver and have tried the procedure further on the living, I hope to elaborate this preliminary note into a systematic and complete article.

828 Beacon Street.

Two Unusual Cases of Brain Abscess.—Left Hemisphere. E. J. MOURE. *Rev. hebdomadaire de Laryngologie, d'Otologie, et de Rhinologie*, Jan. 14, and 21, 1911.

Old suppurations, especially of the cholesteatomatous kind, give rise to cerebral, cerebellar and sinusital complications. It is necessary to distinguish, symptomatologically, between suppurations of the hemispheres. When the left side is affected, there are facial disturbances which may be detected upon thorough examination; if the affection is localized in the left hemisphere, the disturbances are less pronounced.

In both cases the same technic was employed: trepanation; puncture of the abscess; drainage of pus, etc. The method of draining must be modified to meet the requirement of the particular case.

Ed.

A RESUME OF THE MODERN OPERATIVE PROCEDURES IN EAR AFFECTIONS.*

BY H. B. GRAHAM, M. D., SAN FRANCISCO.

It is not my purpose to give a complete description or discussion of the various operative procedures that are followed by the various otologists of to-day, but to review them cursorily in order to give my personal impressions concerning their value. The operative measures of to-day are so varied, and the champions are so blindly enthusiastic in the advocacy of their particular hobby, that one is very apt to become over-enthusiastic about a few procedures to the exclusion of many good ones, and is apt to overlook that pathology and diagnosis of the case which may so readily point the way to the method of operation. In this branch of medicine, possibly more than in any other, are cases improperly operated and even lost on account of a lack of diagnostic skill, or an indifference to the finer diagnostic points, an indifference that has been fostered by the teaching that there is but one operation for an acute case and one for a chronic. That this is not so is amply proved by the successes of Bondy, Heath, Yankauer, Reik and Welty.

In the early stages of the acute cases, there has been a remarkable series in which the symptoms have rapidly disappeared upon the prompt enucleation of the tonsils and removal of the adenoids without any treatment of the ear, and being justified in supposing that the majority of the middle-ear affections are primarily of Eustachian tube origin, we certainly shall make no error in the advocacy of an early removal of these structures. That the same treatment is also effective in later stages is my personal opinion, and I do not hesitate to make an antrotomy, paracentesis, tonsillectomy and adenectomy all at the same sitting, if, within the first two weeks the symptoms are increasing rather than decreasing. The idea that a middle-ear suppuration will produce an infection of the operative field in the throat, seems to me to be overdrawn, inasmuch as the flora of the middle-ear is that of the throat and simply ordinary cleansing-washes sprayed into the nose and throat are enough, in my experience, to relieve any disagreeable symptoms. If one can, by this procedure, cut a middle-ear suppuration down from six to three weeks including after-treatment, and re-

*Read before the meeting of the California State Medical Society, Santa Barbara, April 18, 1911.

lieve the patient of any tendency to chronicity, I believe a step in advance will have been made. In this place I wish to reiterate what has been so often said in regard to measles and scarlet fever, that any unusual rise of temperature should be a signal for the examination of the ears, and that in cerebro-spinal meningitis an involvement of the ears should be promptly met by a drainage of the vestibule in the hope of retaining some of the function of the cochlea. (Alexander).

Modern operators have put their stamp of approval upon the complete (Whiting) operation for all acute cases of mastoid supuration after the third week, and I think the only marked advance made in recent years as a help in our surgery is along the line of the bacteriology of the disease. The classification of the cases into those due to the capsulated and those due to the non-capsulated bacteria as described by Schottmueller and others, has taught the surgeon to be on the lookout for cranial and venous complications in the cases due to capsulated bacteria and to seek the extreme recesses for areas of necrosis and hidden underminings. Better uncover wide the sinus and meninges in these cases than take any chances on leaving foci.

As to the method of dressing I cannot but feel that in these latter cases the open method with a loose packing is our only salvation, whereas in the cases due to non-capsulated bacteria the blood-clot and Beck's bismuth paste may be safely tried without any danger to the patient and the worst that can happen is to open the wound and drain as though the blood-clot or paste were not there; either will come out if markedly infected, and if not, one has saved the patient possibly weeks of disagreeable dressings. Our limited experience with the paste at Cooper College has been very satisfactory. To condemn the blood-clot as a means of healing without first giving it a fair trial under thorough antiseptic methods, is certainly narrow in the face of a 90 per cent primary healing reported by Reik. The technic is simple; after a thorough operation and washing with hot salt solution the cavity is allowed to fill with blood, the subcutaneous tissues being scarified in case the oozing is insufficient to fill the cavity, and a subcutaneous silver wire suture used with silver foil dressing. With Beck's paste the wound may be sutured and a long-nosed syringe then introduced between the sutures for the injection.

In our chronic cases the field for a differential diagnosis is much larger and we have certainly marched far beyond the complete radical alone for every case of suppuration.

Yankauer has hit upon a valuable aid to conservatism in his curettement of the Eustachian tube with his simple instruments in those cases of suppuration that seem to be confined to the antrum without necrosis or cholesteatoma and where the irritation is in the tube. The procedure is carried out through a drum perforation under local anesthetic (carbolic, cocain, menthol) care being used to see that all sides of the tube are thoroughly curetted as far as the isthmus and even though the tube does not remain permanently closed, the suppurative process often stops. I have had patients state that their hearing was better and that a former ringing in the ears had disappeared under this procedure.

The hammer-anvil extraction is seemingly never practiced on this coast, but it has not by any means disappeared in European cities, and one eminent otologist told me that that small operation comprised the larger part of his private operative work. One may use local anesthesia (cocain injection) with a special syringe (Neumann) that has the flat portion of the needle-point directed squarely upward when attached to the syringe, and with three or four simple instruments the operation is quickly performed in the ambulatorium. It affords a good view of the attic, and better drainage for the antrum and has its place in otology especially among cases that are averse to a more radical procedure.

The controversy over the Heath and later the Bondy operations, has waxed strong for so long that it would seem as though some definite knowledge concerning their value should have been arrived at. Heath removes the posterior wall of the external auditory canal down to the ring and then makes a plastic and flushes the middle-ear by means of a cannula which is modeled for the patient at the time of operation. Bondy removes the lateral attic wall as well, and claims that the lack of trauma to the promontory is enough to preserve a good hearing. There is no doubt but that a certain class of cases will get well under these operations, namely, those in which the pathology is in the antrum alone, but that these are procedures that can be followed in a majority of the cases, I doubt. How to make a diagnosis of antral disease without attic involvement is a question. Possibly if at operation one were to find enough pathological trouble in the antrum to account for the secretion or polyp-formation, he would be justified to be content with a Heath operation; whereas, if he did not find an explanation for these features, he could seek further and do a Bondy or a Kuster-Bergmann. That one may make the required diagnosis before operation in a few cases is beyond a doubt, as I have proved by personal

experience. Whether the results as far as hearing are concerned justify the care necessary in the Bondy operation in the face of Dr. Welty's results with the skin grafts, is doubtful. Then too, Dr. Bondy's patients were all tested within six months after the operation, and it is well known (Mackenzie-Alexander) that with our old methods of operation and healing, the hearing may improve immediately after the operation but that one and a half or two years subsequent the hearing is always less than before the operation and this may be so with Dr. Bondy's cases.

Cheate, of London, has shown that 20 per cent of all temporal bones retain throughout life what he calls the infantile type; that is, an antral wall composed of a thin layer of compact bone, and an inner layer of fine cells, which he has termed fetal cells on account of their being formed before birth; the mastoid mass is, as a rule, diploic, but may be dense. He thinks that the larger number of chronic suppurations are in this type of bones and that the dense antral wall is the cause not the effect of the suppuration as heretofore held. There is no evidence microscopically that this dense bone is pathological. Under these conditions the Kuster-Bergmann operation is perfectly rational, especially where we can demonstrate that our pathology is in the antrum and attic. In this operation a triangular portion of bone is removed at the supra-meatal triangle, and the radical completed leaving the mastoid intact. If there is any suspicion that the mastoid cells are involved, the patient should be given the benefit of the doubt and everything removed. In this operation the cavity of the middle-ear is left in the same condition as in the complete, the advantage lies in the short after-treatment and lack of deformity.

The complete radical is so well known that I will simply mention a few points that make for ease and success. In the first place, operate the diseased ear, use as large a chisel at all times as is convenient instead of as small. In order to preserve the sharpness of the chisel, cut bone at every stroke and do not allow the chisel to slip over the bone. Proceed with some definite system completing what is in hand before passing to the next field; this makes for rapidity and completeness. My order of procedure is that taught so thoroughly by Dr. Neumann, of Vienna. Open the antrum, widen it backwards, cut through the bridge, trim the superior wall and zygoma region, take the mastoid cells out posterior to the facial ridge, carrying the chisel always parallel to the facial ridge and keeping outside of the external border of the horizontal canal; take the ridge down level with the horizontal canal, chiseling in

same direction and protecting the canal thoroughly; now chiseling at right angles to the ridge, level it at its external end and lastly with the chisel vertical knock off the overhanging portion; this means thorough knowledge of the anatomy of the canal. Remove the mastoid cells at the tip, uncover sinus and removing the tip if indicated. This leaves to the last the most dangerous portion and in case of accident, the most important part has been accomplished, a packing may be placed and the operation closed. Do not be afraid of uncovering sinus or dura as these cases heal more rapidly than those with bone cortex intact and there is no danger of infections if the opening is large; if it is small, make it large. In removing the bridge let the last stroke of the chisel be at the upper end as breaking this bridge through from below endangers the horizontal canal and facial nerve. Remove splinters from in front of promontory as they can be very easily driven into that structure. Protect the mucous membrane of the middle-ear with gauze or cotton during the operation and the hearing subsequent to operation will be improved. In order to remove the tip, place the chisel vertically at the external auditory canal and give a sharp rap, then again at the posterior surface of the mastoid and the fracture will be complete; grasp the tip with heavy forceps and sublucate the same outward, removing the muscle by means of a pair of scissors; do not pull out any stray fiber from the neck as this is the main cause of a cervical infection.

The various methods of entering the antrum are practically all a matter of personal choice, whether one proceeds by the Stacke, Schwartze, Zaufal or Von Troeltsch methods, or whether he is in the habit of using a burr or a chisel, the point of importance is to know what he is doing.

In cholesteatomatous cases, if the matrix is not removed, the cholesteatoma will reform and has to be cleaned out at intervals throughout the life of the patient; this is no hardship if the patient remains within call of the ear surgeon, but that is not always the case and then the cholesteatoma becomes a menace to the comfort or life of the patient.

Of the labyrinth operations there are three types. The Hinsberg consists of an opening of the superior and horizontal canals at the exposed surfaces under careful protection of the facial and then the removal of the promontory wall. According to Bárány, this operation is only indicated in cases of fistula or serous labyrinthitis when after a radical operation the patient has a continual dizziness of which he wishes to be rid.

The Jansen operation is more complete the whole triangle at the posterior internal surface of the operative field after the radical operation has been performed being removed exposing dura and sinus. The bone should be removed as far as possible external and posteriorly to the sinus to start in with as the operator must have room in which to complete his operation. The bone in the triangle bounded by the sinus transversus, facial canal and petrous sinus may best be removed by thinning and then placing the chisel vertically and chiseling onto a curette placed between the bone and dura. This should be continued until the posterior canal has been opened which will be recognized as a long oval opening in the horizontal axis as the patient lies on the table. The canal should be followed directly toward the horizontal canal until this one is opened. We now have three openings in view; two for the posterior canal, and one for the horizontal. The upper of the two posterior openings and that of the horizontal should be followed until the vestibule is entered and as a last move the promontory wall removed.

The Neumann operation only differs from this in that the internal auditory canal is entered from behind by chiseling away successively small pieces of bone from the pyramid, this modification depending upon the observation made by Neumann that many cases of meningitis apparently start from a focus of pus at the bottom of the internal canal where the pia and dura are not in contact.

The Frey-Hammerschlag-Richards method I mention only to condemn. The operators open the canals without exposing the dura. It is a tedious method and where it is indicated the Hinsberg would be indicated, the latter having the advantage of being more easily performed. This narrows our labyrinth operations down to practically two methods, the Hinsberg and the Jansen-Neumann, and the indications for the Hinsberg are so limited that one but seldom has occasion to use it.

Any labyrinth operation holds out great dangers for the facial nerve, yet one can readily see what a thorough knowledge of anatomy and good technic, as acquired on the cadaver, means when we say that neither Neumann nor Rutin have ever had a facial paralysis following a labyrinth operation. The greatest dangers lie: (1) at the inferior arm of the posterior canal; (2) in a fracture through the facial ridge, caused by the chisels being used as a lever against it on removal of the promontory; (3) in unskilled and unnecessary efforts on the part of the operator to pass a probe

through the oval window into the canals. If the probe is used at all it should pass from behind forward and then with care.

The appearance of a number of articles by prominent aurists of late, describing labyrinth operations of the Hinsberg type in labyrinthine suppuration, shows plainly that the surgeon has not as yet grasped the full import of the Jansen-Neumann method of procedure. One of the principal objects in this method is the exposure of the meninges between the sinus and internal auditory canal in order to allow ready access to the cerebellum, this being desired on account of the frequency of association of cerebellar abscess and labyrinthine suppuration. If this exposure has been made and an abscess occurs subsequent to operation, or was present and not diagnosed at operation, it may be readily opened without an anesthetic by simply incising the dura and then plunging a brain knife into the cerebellum; the patient will feel nothing; whereas in all other methods of procedure the patient must be subjected to a second anesthetic and further bone removal.

I wish here also to emphasize what has so often been said before, that the man who operates a suppurating ear without first being thoroughly familiar with the condition of the internal ear is making a grave, if not criminal error, as he has no way of judging the seat or progress of certain complications subsequent to operation. I have seen this very thing done by the most renowned surgeons with the most disastrous and unnecessary results and in the light of the present-day knowledge of the complications of suppurative ear affections it is unpardonable.

As far as plastics are concerned, there are two types that it is well to know how to do quickly and well—the Panse and the Passow, and these may be modified to suit the operator's convenience. The Panse is a T-shaped incision with the long leg pointing toward the promontory; it may be made Y-shaped and the outer arms carried as far as the operator pleases into the concha as exhibited in the Siebermann and Neumann plastics. The outer flap of the Y-shaped plastic should be sewed back so as to present a smooth skin surface to the gauze packing as the pain at dressing will be much decreased by this simple procedure. The Passow flap uses the whole of the posterior wall as a single flap with an attachment at the internal superior angle. This is swung above and held in place by gauze. It is ideal for the Kuster-Bergmann operation.

For closure I am in the habit of using the clamps, which may be removed after 36 hours if an invisible wound is desired or left for five or seven days if the operator so wishes.

One of the most difficult chapters of the operative procedures is that of the after-treatment. Better have a poor operation and good after-treatment, than vice versa. Only after handling hundreds of cases in a large clinic does one realize how discouraging this part of the work is. The open treatment without skin graft is the method most often practiced at the present day and under it no two cases heal alike; one has a cavity filled with granulation-tissue and epidermized, or there is a false membrane or a large cavity with epidermis lying in the bone and all grades between these. The scarlet red ointment, 25 per cent, or power has helped to hasten the epidermization, but possibly the greatest advance has been in the perfection of the technic of the skin graft as practiced by Dr. Welty. Why the grafts were given up by Jansen and others in Europe, I cannot say, but possibly because the technic was faulty leading to poor results. That a properly placed graft will save much worry and time there is no doubt, but strict attention should be given to asepsis and the dressing. Dr. Welty's technic consists of a thorough eradication of the diseased bone, and smoothing of the cavity with hand burs; the mucous membrane of the tube and promontory having been carefully removed, grafts of one by one and one-half inches are placed in juxtaposition covering the entire cavity beginning at the tube, a dressing of small pieces of dry gauze is placed against the grafts, and over this others saturated with paraffin oil containing one-half per cent solution of carbolic acid, the mixture having been sterilized by heating three times to 150° C. Dressings are removed on the fourth day and the cavity irrigated with bichloride 1-3000, followed with normal salt solution. Dr. Welty claims for the method an improved hearing and rapidity of complete healing. That attention to detail has accomplished a large part of his success is without doubt.

209 Post Street.

Ozena and Tuberculosis. ROBESSA and SANTINA. *Rev. barcelonesa de Enf. de Oído, etc.*, March 31, 1911.

The general aspects of ozena and tuberculosis are entirely different. But ozena weakens the general conditions and thus aids the development of the tubercle bacilli. Ed.

THE RELATION OF THE INTERNAL CAROTIDS AND OPTIC COMMISSURE TO THE PITUITARY BODY.*

BY OTIS H. MACLAY, M. D., CHICAGO.

Since it has been demonstrated that the pituitary body can be operated upon by the intra-nasal route, I believe it timely to consider the dangers that could occur from injury to the adjacent structures.

In this region, lying within a few millimeters of one another, we find the internal carotids, the cavernous sinuses, and the optic commissure. The anterior circular sinus located just in front and near the upper part of the pituitary body if injured could probably be satisfactorily controlled by pressure.

The distances between these structures vary owing largely to the different shapes of the body of the sphenoid. The commissure may also be irregularly placed.

The internal carotids lie on the inner side of the cavernous sinus in the carotid groove, which is located on the sides of the body of the sphenoid. Figure 1, a diagram from Gray's Anatomy, illustrates this point. Here we have the dura between the artery and groove, and the dura and sinus lining, between the bone and the cavernous sinus.

According to Gray, the optic commissure rests upon the olivary eminence and the anterior portion of the diaphragma sellae. This varies, however, and in one specimen which I have here this evening the commissure is located so far posteriorly that it lies over the dorsum sellae.

By a study of these specimens and a comparison of the measurements that I have taken, it is evident that extreme care must be exercised in any operative procedure in this region. The distance between the internal carotids varies but the greatest distance is only a few millimeters on the dried skulls and it is reasonable to suppose that these dried specimens, because of some shrinking, show more room than the living. The optic commissure situated above the diaphragma sellae would appear to be fairly safe but the variation in the depth of the pituitary fossa and the different slants of its anterior wall reduce its safety to a minimum.

*Read before the meeting of the Chicago Laryngological and Otological Society, May 16, 1911.

If the operation were always done on a decided enlargement of the pituitary body, bulging into the sphenoidal sinus or pushing the carotids and optic commissure aside, the danger would be greatly minimized, but even with these structures pathologically forced into safety there still would remain the cavernous sinuses which unfortunately are so firmly attached to the bone that they cannot be pushed aside. The operator must enter the pituitary fossa by going through the sella turcica and not a few millimeters to one side, since here he would break down the back wall of the sphenoidal sinus and against this wall we find the internal carotid and the cavernous sinus. Furthermore, the bone in this region in almost all the heads examined is thinner than that of the sella turcica and in many of the specimens as though made of the thinnest shell.

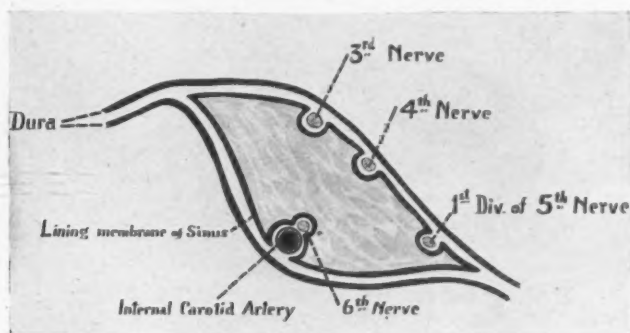


Figure 1. Diagram of cavernous sinus from Gray's Anatomy illustrating position of internal carotid at inner side of sinus.

My measurements give the distance between the internal carotids, the breadth of the sella turcica, and the distance from the deepest part of the pituitary fossa to the top of the anterior wall of the fossa, in other words, to the posterior edge of the olivary process. Here the diaphragma sellae is attached and on the anterior portion of the diaphragm rests a part of the optic commissure.

The breadth of the sella turcica was taken as the distance between the carotid grooves.

The inter-carotid measurements are as follows and are probably a few millimeters broader than in the living, due, as stated before to shrinking and also to manipulations tending to separate them.

INTER-CAROTID MEASUREMENTS.—1, 10 mm. 2, 8 mm. 3, 8 mm. 4, 13 mm., Left carotid very large, coming to 4 mm. of median

line. Right carotid well to right side. 5, 7 mm. Right carotid comes to median line. Left carotid pulled away but from right carotid to left carotid groove is 7 mm. 6, 10 mm. Between carotid grooves vessels pushed aside. 7, 10 mm. 8, 12 mm. Between

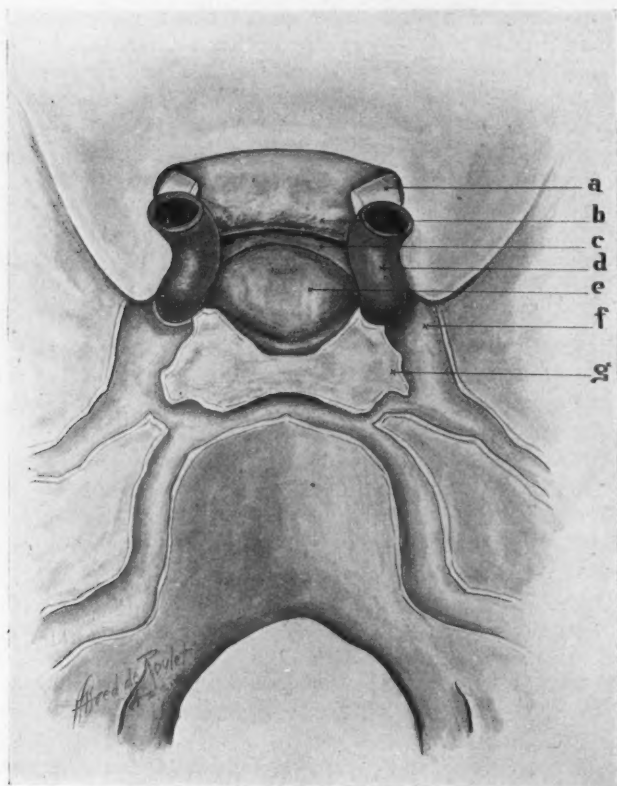


Figure 2. From specimen. (a) Optic nerve; (b) olivary process; (c) anterior circular sinus, (diagrammatic); (d) internal carotid; (e) pituitary fossae; (f) cavernus sinus; (g) dorsum sellae.

carotid grooves vessels destroyed. 9, 8 mm. 10, 10 mm. 11, 10 mm. 12, 10 mm. 13, 10 mm. 14, 14 mm. The average of inter-carotid measurements 9.2 mm.

The breadth of the sella turcica or the distance between the inner margin of the carotid grooves is slightly broader than the inter-

carotid measurements. These figures are taken at the widest portion of the base of the fossa and, consequently, fail to show the true width at all points. To illustrate the variations in the distance across the saddle I shall mention an exceptional specimen where the posterior breadth of the fossa was 10 mm. and the upper part of the anterior wall lying between the carotids only 5 mm. This on horizontal cross-section gives a wedge-shaped body, pointing anteriorly, having a base 10 mm. in breadth and an apex of only 5.

WIDTH OF SELLA TURCICA.—1, 12 mm. 2, 9 mm. 3, 11 mm. 4, 9 mm. 5, 13 mm. 6, 10 mm. 7, 10 mm. 8, 12 mm. 9, 10 mm.

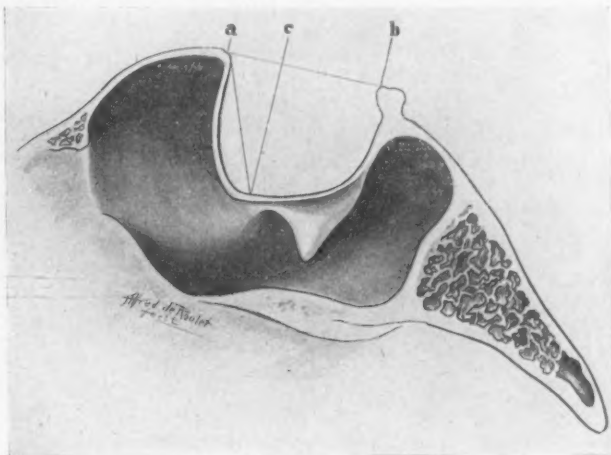


Figure 3. Deep cup-like pituitary fossa: (a) posterior margin of olivary process: (b) dorsum sellae: (ac) length of anterior wall of fossa: (ab) (dotted line) diaphragma sellae.

10, 10 mm. 11, 11 mm. 12, 10 mm. 13, 12 mm. 14, 11 mm. 15, 9 mm. 16, 12 mm. 17, 11 mm. 18, 16 mm. 19, 17 mm. 20, 13 mm. Average width of sella turcica 11.4 mm.

The length of the anterior wall or the distance from the posterior margin of the olivary process to the deepest part of the fossa is an average from 42 measurements. These to be appreciated must be closely compared with the specimens and in order to show their significance, I have had three diagrammatic drawings made which show the difference in the shapes of the fossae. Figure 3, the deep cup-like type; Figure 4, the shallow, elongated, trough-like shape, are the extremes, while Figure 5 represents the average.

DISTANCE FROM POSTERIOR MARGIN OF OLIVARY PROCESS TO DEEPEST POINT OF FOSSA.—1, 9 mm. 2, 6 mm. 3, 7 mm. 4, 8 mm. 5, 8 mm. 6, 9 mm. (very shallow as Figure 4). 7, 8 mm. 8, 9 mm. 9, 10 mm. 10, 10 mm. 11, 8 mm. 12, 8 mm. 13, 10 mm. (large solid body of sphenoid having very small sinus at extreme left side of bone. Sella turcica at thinnest point 8 mm. thick). 14, 7 mm. 15, 9 mm. 16, 10 mm. 17, 6 mm. 18, 6 mm. 19, 9 mm. 20, 9 mm. 21, 8 mm. 22, 8 mm. 23, 12 mm. (very shallow as Figure 4). 24, 9 mm. 25, 7 mm. 26, 9 mm. 27, 8 mm. 28, 8 mm.

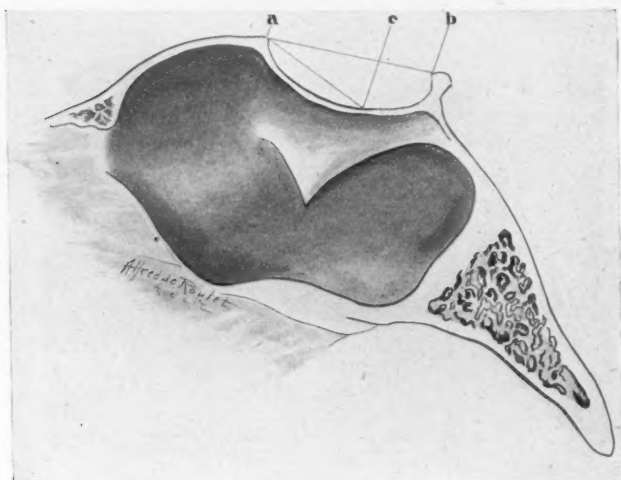


Figure 4. Shallow trough-like fossa. Points a, b, c, ac and ab, same as figure 3.

29, 7 mm. 30, 6 mm. 31, 7 mm. 32, 10 mm. 33, 8 mm. 34, 6 mm. 35, 6 mm. (very shallow). 36, 9 mm. (very shallow). 37, 7 mm. 38, 9 mm. 39, 13 mm. (sella turcica 4 mm. thick). 40, 6 mm. 41, 8 mm. 42, 9 mm. Average of measurements 7.6 mm.

An interesting point in this group of measurements is that some of those giving the greatest distance are in reality the most hazardous for operating, since the fossae are extremely shallow and, consequently, the roofs and floors of the fossae are only a few millimeters apart. The optic commissure, is, as you see, the structure to be feared in these.

Fourteen of the skulls examined were sufficiently perfect to allow the three measurements to be taken, while in the others only two

could be taken and in some cases only one. The following table illustrates this. The first figure refers to the intercarotid, the second to the sella turcica; and the third to the distance from posterior margin of olivary process to deepest point of fossa. 1, 10 mm., 12 mm., 9 mm.; 2, 8 mm., 9 mm., 6 mm.; 3, 8 mm., 11 mm., 7 mm.; 4, 13 mm., 9 mm., 8 mm.; 5, 7 mm., 13 mm., 8 mm.; 6, 10 mm., 10 mm., 9 mm.; 7, 10 mm., 10 mm., 8 mm.; 8, 12 mm., 12 mm., 9 mm.; 9, 8 mm., 10 mm., 10 mm.; 10, 10 mm., 10 mm., 10 mm.; 11, 10 mm.; 11 mm., 8 mm.; 12, 10 mm., 10 mm., 8 mm.; 13, 10

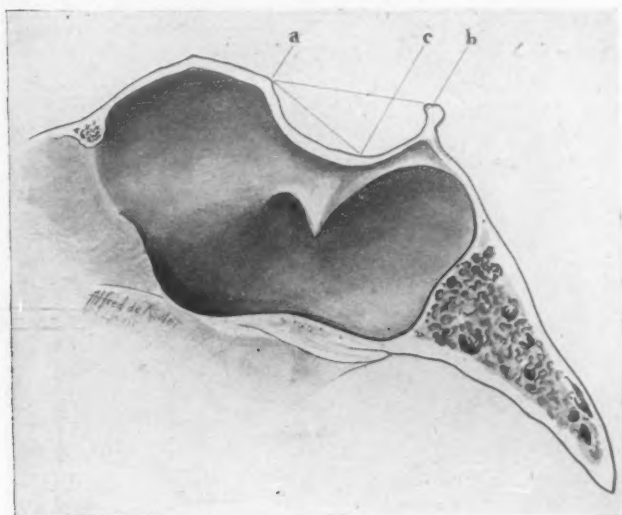


Figure 5. Depth of average fossa. Points a, b, c, ac and ab, same as figure 3.

mm., 12 mm., 10 mm.; 14, 14 mm., 11 mm., 7 mm.; 15, —, 9 mm., 9 mm.; 16, —, 12 mm., 10 mm.; 17, —, 11 mm., 6 mm.; 18, —, 16 mm.; 6 mm.; 19, —, 17 mm., 9 mm.; 20, —, 13 mm., 9 mm.; 21, —, —, 8 mm.; 22, —, —, 8 mm.; 23, —, —, 12 mm.; 24, —, —, 9 mm.; 25, —, —, 7 mm.; 26, —, —, 9 mm.; 27, —, —, 8 mm.; 28, —, —, 8 mm.; 29, —, —, 7 mm.; 30, —, —, 6 mm.; 31, —, —, 7 mm.; 32, —, —, 10 mm.; 33, —, —, 8 mm.; 34, —, —, 6 mm.; 35, —, —, 6 mm.; 36, —, —, 9 mm.; 37, —, —, 7 mm.; 38, —, —, 9 mm.; 39, —, —, 13 mm.; 40, —, —, 6 mm.; 41, —, —, 8 mm.; 42, —, —, 9 mm.

The average measurements placed together for comparison are as follows: Average distance between inter-carotids, 9.2 mm. Average distance between carotid grooves, 11.4 mm. Average dis-

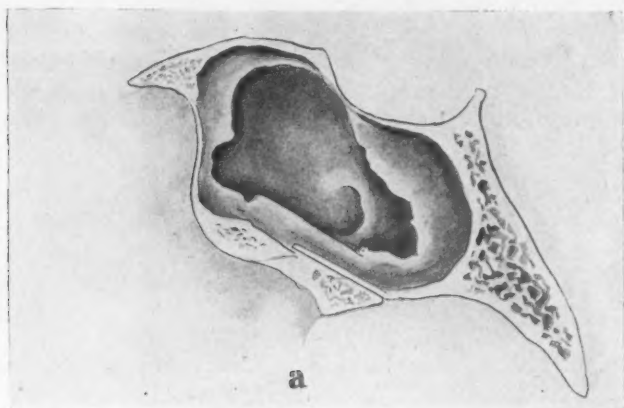


Figure a. A hollow body sphenoid or sphenoid with large sinuses; (a) sella turcica very thin.

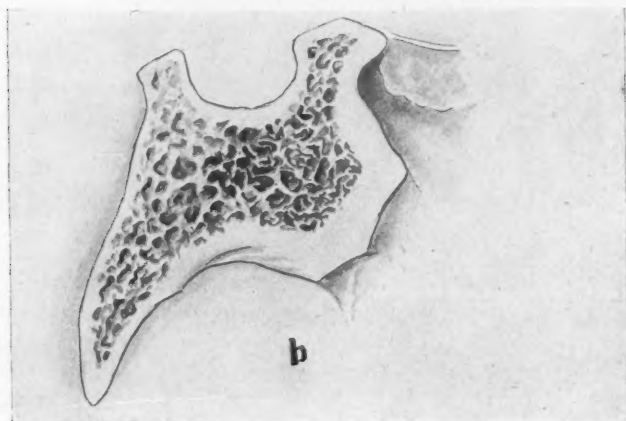


Figure b. Solid body sphenoid; (ab) bone; (bc) cancellous bone.

tance from posterior margin of olivary process to deepest point of fossa, 7.6 mm.

Changes in the shape of the body of the sphenoid give many differences in the relative positions of the structures mentioned,

and when it is almost solid and very thick, adds materially to the difficulties presented in the intra-nasal route operation. These can be most safely avoided by the accurate knowledge of their existence and it has been with such a point in view that I have endeavored to give a picture of the anatomy of this region.

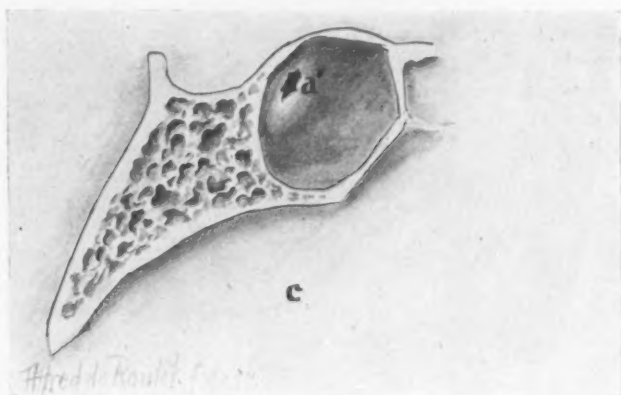


Figure-c shows bulging of (a) internal carotid; into posterior wall of sphenoidal sinus. Bone extremely thin and carotid only 3 mm. from median line.

These measurements have been made in the Anatomical Department of the Northwestern University Medical School. I wish to express my thanks to Dr. G. D. Scott, of the Anatomical Department for his assistance in this work.

15 Washington Street.

Tonsillectomy in Chronic Affections. SYME. *Arch. internat. de Laryngol. d'Otol. et de Rhinol.*, Jan., 1911.

The author favors the radical removal of the tonsils, a technic which seems to be gaining more and more adherents. He points out that a diseased tonsil should be removed in toto, for the deeper portions are always those most affected.

Ed.

A REMARKABLE CASE OF INTRA-NASAL DESTRUCTION FROM DISEASE WITHOUT ANY DEFORMITY.*

BY OTTO J. STEIN, M. D., CHICAGO.

This case presents the most gigantic degree of destruction within the nose that I have ever seen or heard of, and what is still more remarkable, there is no evidence whatsoever on the face or in the throat of any such destruction.

The patient, Mary R., single, 45 years of age, presented herself at the Post Graduate Clinic because of a right-sided otalgia, but with no nasal complaint whatsoever. She gave a history of a severe "catarrh" for twenty years but was never under special treatment and denies knowledge of lues.

An inspection of the interior of the nose reveals an absolute absence of every one of its structures. In front is the cutaneous septum forming two perfect meati, with no signs of fissure, scar or deformity. Within there is one large cavity lined with a smooth glistening membrane. There is no septum. The floor of the nose is smooth and level from side to side and fore to back, with the hard and soft palate intact. There is no vestige of any turbinates. The ethmoid labyrinths have entirely disappeared and also the nasomaxillary walls, so that the bony orbits present themselves directly in the nasal cavity. The maxillary antri are part of this one large cavity. Direct inspection of the sphenoidal cavities can be had and the pharyngeal openings of the Eustachian tubes are very large and can be examined with ease through the nose.

32 North State Street.

*Presented to the Meeting of the Chicago Laryngological and Otological Society, March 21, 1911.

Unusual Case of Otitic Pyemia due to the Tetragonic Micrococcus.

C. CALDERA and G. PINAROLI. *Arch. ital. di Otol., Rinol. e Laringol.*, Jan., 1911.

Culture made from the blood showed the presence of numerous tetragonic micrococci in pure culture. Ed.

SPECIAL EDITORIAL DEPARTMENT

THE EDITOR'S DESK.

Personal Impressions, Experiences and Comments.

BY MAX A. GOLDSTEIN.

The Third International Laryngo-Rhinological Congress was held in Berlin, August 30 to September 2, 1911. It was, indeed, a pleasure and a privilege to all who participated in this congress to be the recipients of a most liberal hospitality on the part of the city of Berlin, the president of the congress, our esteemed colleague, Geh. Prof. Dr. B. Fraenkel, the members of the executive committee headed by that most active and energetic worker and secretary of the congress, Prof. Dr. Rosenberg, and the fellows of the Berlin Laryngological Society.

Berlin, to-day one of the modern great metropolises, is especially characterized by its cleanliness, system and order, aggressiveness and incomparable civic energy; in our opinion it stands to-day as the model, progressive metropolitan city of the world, with these ear-marks of a city's growth. The same spirit and pride that actuates and stimulates the people of Berlin in the development of the great German capital was clearly in evidence in this successfully conducted International Congress of Laryngo-Rhinology. The five days' session of the congress, including its valuable and instructive exhibits, its scientific programs, its sumptuous banquets and social functions, its enjoyable and interesting excursions,—all were conducted with characteristic German promptness, care and precision.

The systematic arrangement of the details of this convention was in itself an interesting study. The scientific sessions and exhibits were held in the spacious quarters of the Herrenhaus of the German Parliament. All members of the congress were accorded every possible courtesy and attention and those of us who have attended frequent international conventions, where all nationalities are represented and where a Babel of languages is heard, were impressed by the lack of confusion and the ease with which the numerous scientific and social functions were systematically conducted. Much

credit is certainly due to the executive committee and especially to its genial and energetic secretary, Prof. Dr. A. Rosenberg, who seemed to be the guiding spirit everywhere.

The scientific program was, perhaps, a bit unwieldy because of the limited time at the disposal and the large number of papers presented. Unfortunately, an international congress in special surgery occurs at such infrequent intervals that much subject-matter is available for presentation and the program is invariably too bulky.

The four symposia were promised as a special scientific feature, but we cannot refrain from expressing our disappointment in the manner with which these symposia were presented; instead of giving them the scientific prominence which they merited in the active sessions of the congress, many of the essayists contented themselves with a very brief resumé of their addresses, and to those of the members who had not previously had an opportunity of carefully reading the addresses in full such a presentation was more or less unintelligible and unsatisfactory.

The first symposium, "The Relations of Experimental Phonetics to Laryngology," was presented by Prof. Gutzmann, of Berlin, and Dr. Struyken, of Breda, Holland. Much painstaking work has been done by these original investigators in this special field and it is evident from the papers and demonstrations here shown that the time is close at hand for the crystalization of much of this experimental data and the application of this information to the practical and clinical treatment of speech-defects.

The second symposium on "Bronchoscopy, Esophagoscopy; Their Indications and Contra-Indications," was presented by three of the most active workers and investigators in this modern specialty: Prof. Killian, formerly of Freiburg, now of Berlin, Dr. Kahler of Vienna, and our able American colleague, Dr. Chevalier Jackson, of Pittsburg. Unfortunately, sickness in the family prevented Dr. Jackson's personal attendance at the congress.

Equal to this symposium in importance and interest was the remarkable exhibition of instruments for endoscopy; this exhibit included the entire array of instruments from the first models to the perfected and most recent instrumentarium. These instruments and apparatus were chronologically arranged and exhibited for the deliberate inspection of each member of the congress. They presented in practical form the complete history and evolution of this important innovation.

The third symposium, "The Lymphatic Apparatus of the Nose and Naso-Pharyngeal Cavity in its Relation to the Rest of the Body," was presented by Dr. Broeckaert, of Ghent, Prof. Poli of Genoa and Dr. Logan Turner, of Edinburg. Recent developments have proven the importance of the lymphatic distribution of the nose and naso-pharyngeal tract to general systematic infections and the symposium was a timely one and emphasized the necessity of recognizing these relations.

The last symposium, "The So-Called Fibrous Polypi of the Naso-Pharynx, the Place and Mode of Their Insertion and Their Treatment," was presented by Dr. Jacques, of Nancy, and Dr. Hellat, of St. Petersburg.

The readers of *THE LARYNGOSCOPE* will have the benefit of perusing the complete monographs comprising these four symposii, in its pages.

A few words concerning the splendid exhibit of instruments and apparatus may be of interest. All of the recent, improved instruments and the newer technic were exhibited to best advantage and many of these were demonstrated by the members who devised them. Space will not permit a detailed description, but several apparatus and instruments are worthy of special mention:

A photographic camera has been devised by Leiter, of Vienna, for taking pictures of the various cavities of the body, especially those concerned in endoscopy. The camera is a small, circular disc that fits over the endoscopy tubes, equipped with electric light that is arranged as a miniature flash-light; the views are taken on a disc plate, permitting eight exposures, and as the objective is a clear and sharp one, these small negatives may be magnified many times without losing much of the outline. We have seen some excellent photographs of the bifurcation of the trachea, of pathological conditions of the surface of the larynx and of neoplasms in the nasopharynx taken by this miniature camera. No doubt there is an unusual future for apparatus of this type whereby we shall be in a position to more accurately present our pathological findings in our published literature.

A system of treatment of much efficiency and one which has heretofore been given less practical application than it merits, because of the expensive character of the apparatus needed for its accomplishment, is that of a satisfactory inhalatorium. The apparatus exhibited for the first time at this congress by the Inhalations and Baedereinrichtungen Co. of Berlin, seem to supply a very desirable form of inhalatorium; it is a compressed-air-driven ap-

paratus of absolutely dry medicated vapor, developed with such density that it is almost impossible to see the hand at arm's length from the eye when seated in a small room in which this vapor is produced. The air is so dry that clothing exposed to the vapor for a period of several hours shows no trace of moisture. It is furnished in many forms from that of the simple inhaler to an equipment intended for a large inhalatorium, and compared with previous equipments is quite moderate in price. This form of treatment has been very popular on the European continent and such "Kur" resorts as Bad, Ems, Reichenhall, Salzburg, Salza Maggiore, are world-renowned for the treatment of catarrhal and inflammatory conditions of the respiratory tract. It might be worth while for our American colleagues to investigate this form of therapy more closely.

A splendid exhibition of radiograms demonstrating the position of the tongue and other organs during phonation and Roentgen pictures of the act of deglutition was presented by Dr. Max Scheier,

Dr. A. Musehold, of Berlin, showed a series of photographs of the larynx made by the old type of camera, with the electric light as an illuminant introduced by glass prisms; the photographed negatives were reproduced considerably enlarged and are adaptable for lectures and demonstrations.

The application of the phonograph and gramophone in experimental phonetics was shown by Dr. Pancancelli-Calzia, of Hamburg. The graphic registration of the voice in song and speech was shown in its manifold types in the beautiful exhibition of Prof. Gutzmann, of Berlin. This demonstration also included an analysis, synthesis and reproduction of the human voice.

Wonderful progress has been made in the instrumentarium for endoscopic work and all of the most recent instruments and their newer modifications were practically demonstrated.

Duemer, of Vienna, showed a new series of his beautifully executed stereoscopic diapositives, including the various steps of the hypophysis operation as developed by Dr. Hirsch, of Vienna. The collection of Prof. Killian of the anatomical evolution and development of the accessory sinuses and numerous new pathological specimens of Profs. Onodi, Hajek, and others are included in this series.

Among the surgical instrument-makers, Reiner and Leiter, of Vienna; Pfau, Detert and Windler, of Berlin, and Fischer, of Freiburg, showed many interesting individual instruments. The writer was especially impressed by a new form of snare demonstrated by

Erhard. The special advantage of this snare is that the wire is attached to one end of the cannula, the other end is drawn inward through the cannula when the snare is driven home, thus imparting to the loop a cutting action, instead of the usual type of strangulation of the engaged mass. A most practical feature of this snare is that the same wire loop can be opened and re-applied without kinking or twisting the wire, a feature which, as yet, has been absent from every other snare.

The valuable collection of pictures of Prof. Gerber, of Koenigsberg, relating to diseases of the upper respiratory tract, was given individual demonstration.

Prof. Gluck and Dr. Sorenson, of Berlin, exhibited their collection of pathological specimens of extirpated larynges and the patients from whom they were removed.

Dr. Kuhn, of Cassel, demonstrated his device for peroral intubation, a method by which preliminary tracheotomy is dispensed with in radical operative procedures about the pharynx and larynx.

This brief sketch of the congress would be incomplete if we failed to mention the interesting excursions and elaborate social functions provided by the executive committee. The general banquet of the congress, in which all of the members, officers and their ladies participated was a magnificent function. The vast and imposing banquet-hall of the Rathaus has probably never before contained such a galaxy of the laryngological profession of the world. It was, indeed, an impressive sight to see the officers of the city of Berlin, with their designated regalia; the representative laryngologists of many countries, most of them in full uniform and decorations, the ladies in their brilliant toilets; the lavish banquet-board and floral adornments, and our few American colleagues in their simple evening dress, with that wonderful painting of the German master, Anton von Werner, "The Congress of Nations," at the far end of the banquet-hall forming a fitting background to this memorable picture.

The excursion by boats to Wannsee and the Swedish pavilion was but another evidence of the lavishness and resourcefulness of the managers of the congress. After the bountiful luncheon, a very interesting, clever and humorous travesty on Salome was performed for the edification of the congressionalists. The burlesque was the creation of Dr. Alfred Peyser, of Berlin, and teemed with constant allusions to laryngological and rhinological data in most grotesque form. The context was printed in the three languages of the congress and produced a continuous ripple of merriment. A fitting

climax to these social activities was a visit of the delegates *en masse* to the Hygienic Exposition at Dresden, after the close of the scientific sessions.

There is no greater pleasure to the hard-working, active laryngologist than that afforded by an international congress of this character; the memory of the more intimate association with so many masters in laryngology will linger in our mind for many years. It is certainly an unusual pleasure and stimulation to come into personal touch on terms of professional and social fellowship with such masters as Profs. Fraenkel, Killian, Denker, von Bruns, Manasse, Friedrich, Brieger, von Eicken, Gutzmann, Rosenberg and Spiess, of Germany; Chiari, Onodi, Kahler, Koschier and Hirsch, of Austria-Hungary; Thomson, Tilley, Grant, W. Williams, Milligan, Turner and Patterson, of Great Britain; Luc, of Paris; Siebenmann, of Basil; Uchermann and Schmiegelow, of Scandinavia; Von Stein and Hellat, of Russia; Gradenigo, Grazzi, Ferreri and Lasagna, of Italy; Botey, Botella, Cisneros, of Spain; Burger and Struyken, of Holland; and many others, together with the modest representation from among our own American colleagues.

In conclusion, just a word about the ladies. Many of the members of the congress were accompanied by their families and it was an added pleasure to see the interest and participation of the wives, daughters, mothers and sweethearts of the congressionists, especially in the many social attractions arranged for them by the ladies' committee and the executives of the congress. Our ladies had an opportunity of meeting the men who are our masterful co-workers in all parts of the world in our life-work, and of enjoying with them the lavish social entertainments of the festive week of the congress.

In 1913, the Fourth International Congress of Rhino-Laryngology will convene at Copenhagen, the active metropolis of Scandinavia, under the presidency of Prof. Schmiegelow, to whom we tender our congratulations on this occasion for the high honor conferred upon him.

M. Goldstein

